January/February 1987

PRACTICAL WINERY

Grapegrowing and Winemaking Review

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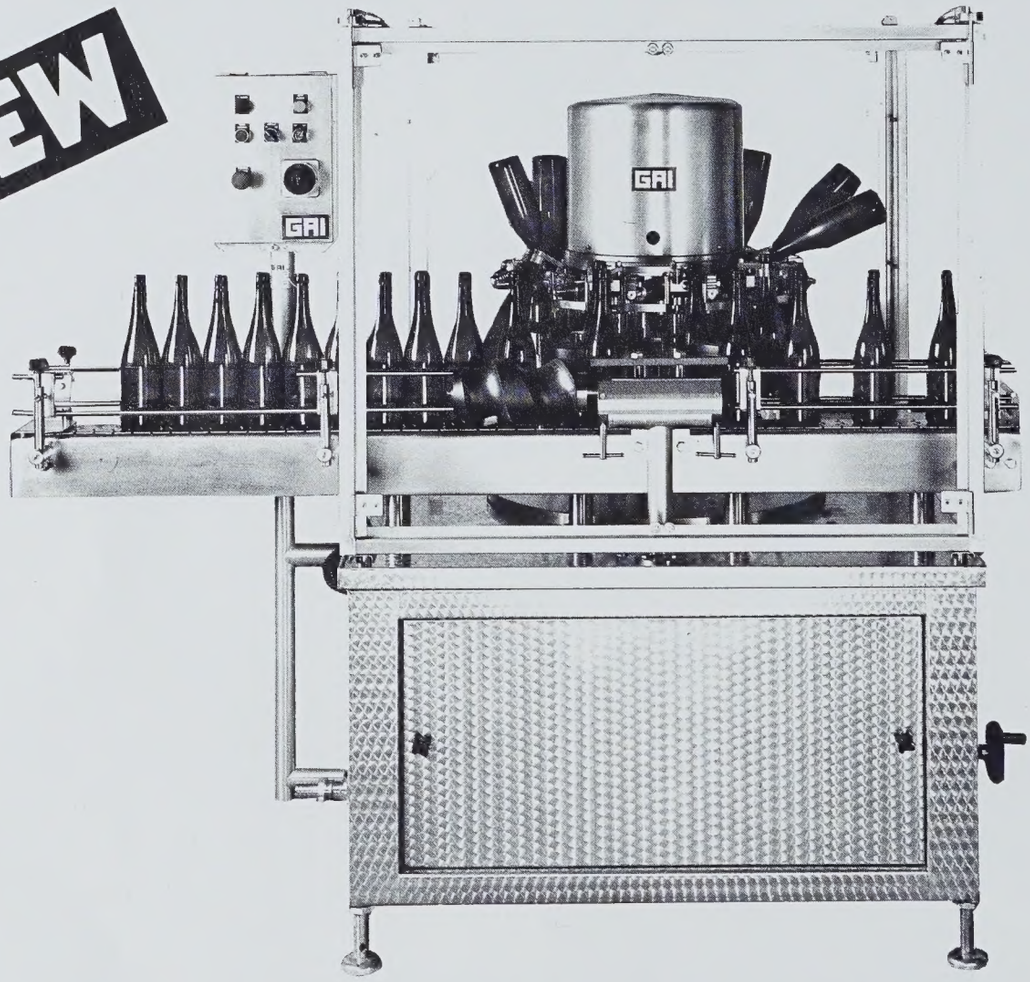

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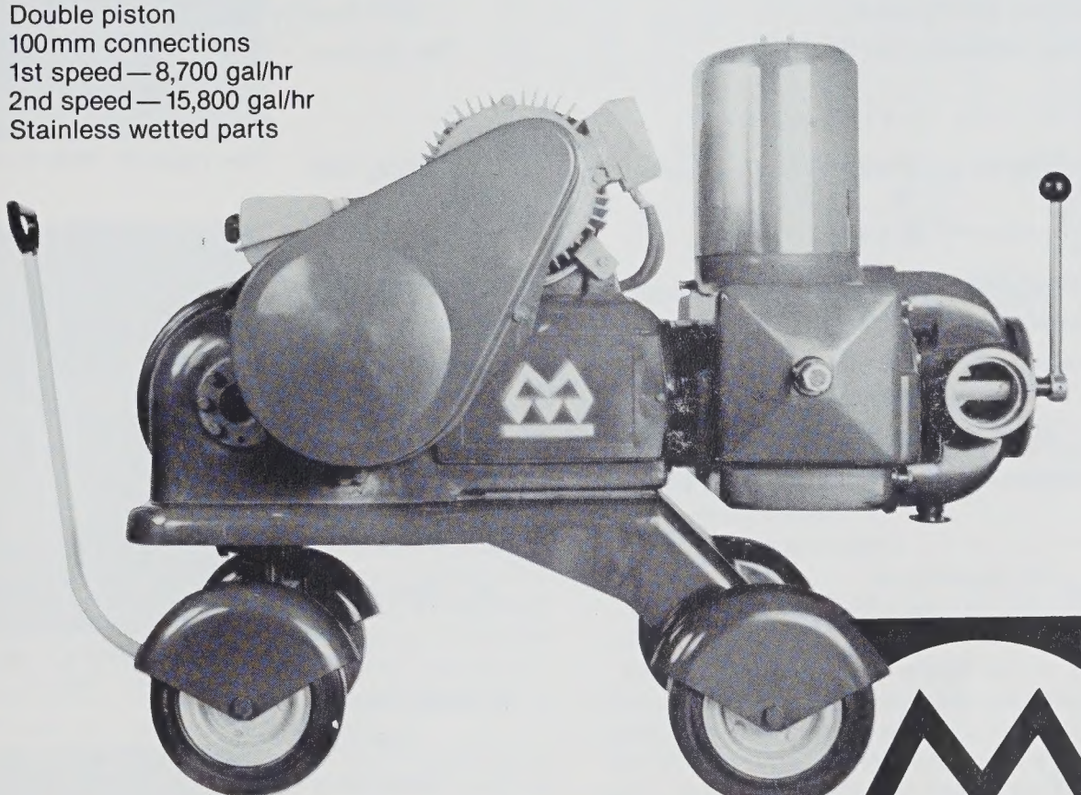

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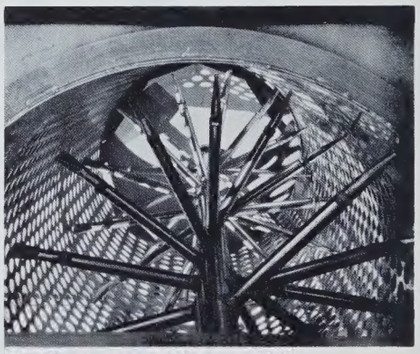
Advertising Manager:	Susan Malone
Printing:	Barlow Printing, Inc., Petaluma, CA
Production:	LaPrath Graphic Productions
Typesetting:	Barlow Typesetting, Inc., Petaluma, CA

Offices: Advertising, Circulation, Editorial: 15 Grande Paseo, San Rafael, CA 94903 USA (415) 479-5819.
PRACTICAL WINERY (ISSN 9739-8077) is owned and published by D.F. Neel. Editorial/Business Office: 15 Grande Paseo, San Rafael, CA 94903 (415) 479-5819. Published bi-monthly at subscription rate of $24.00/year. Outside the United States, please add $8.00US sea mail; $24.00US, air mail. Application to Mail at Second-Class Postage Rates is Pending at San Rafael, CA. Postmaster; please send change of address to 15 Grande Paseo, San Rafael, CA 94903. Back issues: $5.00 prepaid. News media may use no more than 1/4 page of material per issue provided that *PRACTICAL WINERY* is credited.



To destem and/or crush?
See page 38. *Photo by R. White.*

Cabernet-specific form.
See page 47. *Photo by S. Barrett.*

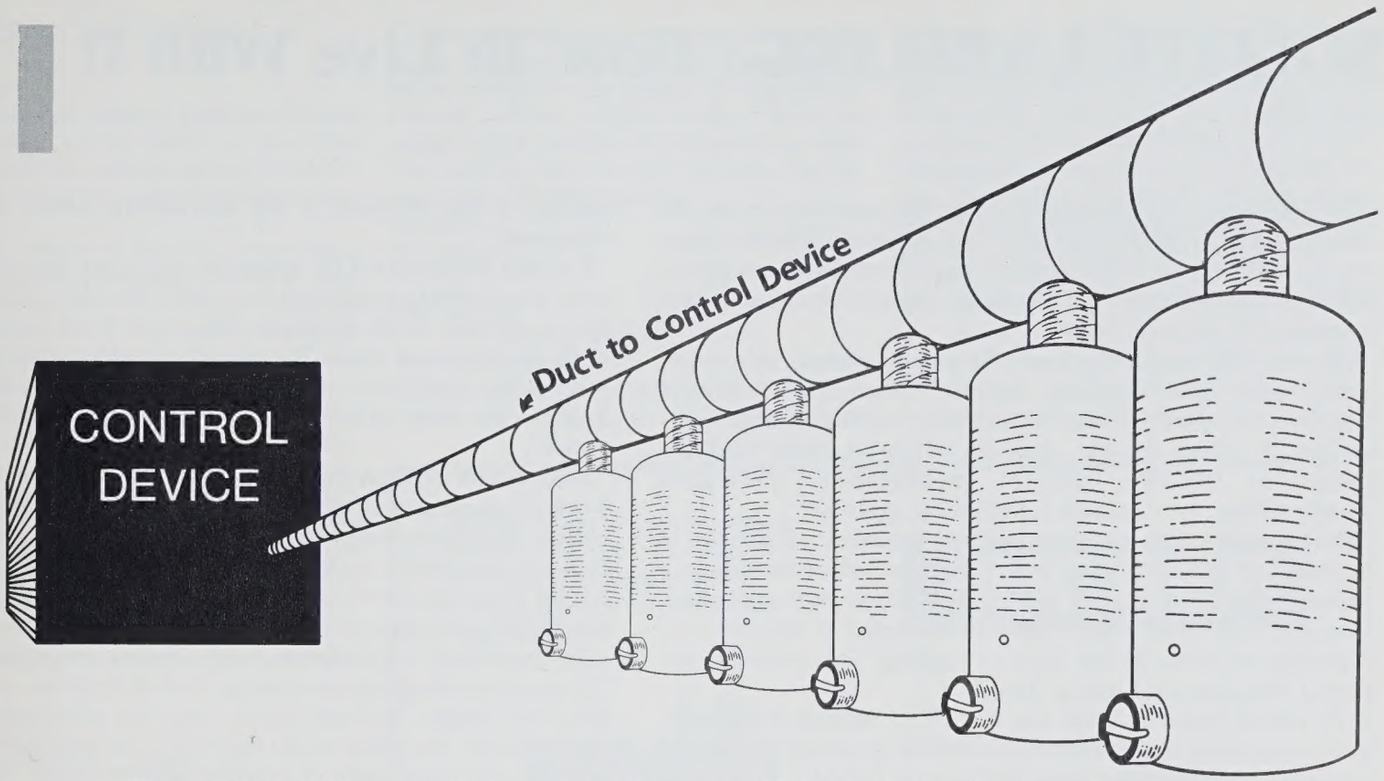
Hail-damaged Burgundian vine.
See page 49. *Photo by D. Blackburn.*

Cover:
Winter at Prince Michel Vineyards, Culpepper, VA. *Photo by Joachim Hollerith.*

"Wine is the invigorator of mind and body, antidote to sleeplessness, sorrow, and fatigue; producer of hunger, happiness, and digestion." Ayur-Veda *(ancient system of medicine)*

OPINION

Free Run



Should California Wineries Recover Ethanol Emissions?

When smog gets in your eyes (to paraphrase an old song), do you immediately pin the blame on winery ethanol emissions during fermentation? Neither do we. But the California Air Resources Board (ARB) does, and, if they get their way, your fermentation tanks may end up looking like the ones pictured above.

Here's the situation: The ARB, in a laudable effort to clean up the air we breathe, has targeted several industries which it believes contribute to the formation of ozone in the atmosphere. (Ozone forms part of the phenomenon called smog.) The California wine industry is a target because it emits ethanol as a product of fermentation. (Ethanol is also a natural byproduct of decaying plant material, including grapevines).

The ARB has proposed a suggested control measure (SCM) to decrease Central Valley wineries' ethanol emissions. The SCM would require wineries to reduce ethanol emissions from fermentation tanks of more than 50,000-gallon capacity by 90%. Wineries would have to submit a plan by May 1, 1989, for installation of control equipment, listing all fermentation tanks and their capacities, and identifying the type of control to be applied to each tank. Control equipment would have to be in place by the 1990 fermentation season.

To determine initial compliance, source testing of emissions from all fermentation tanks subject to control would be conducted at the wineries' expense during the first fermentation season after the SCM is implemented by a local air pollution control district. In addition, a demonstration program would be required for certain wineries during the 1988 fermentation season. Each of four types of exhaust controls (carbon adsorption, condensation, incineration, and scrubbing) would have to be tested.

What Does This Mean to You?

All of this obviously means a great deal of trouble and expense to the wineries involved (and who's to say that it will stop there?), to say nothing of a potential decrease in wine quality. The Wine Institute states: "The proposed control processes will interfere substantially with the operation of affected wineries, may decrease wine quality, and may present a threat of contaminating fermenting wine."

In addition, none of the control technologies proposed by the ARB has ever been proven to work on winery fermentation tanks. (No vendor has guaranteed price or performance of these technologies when adapted to ethanol.) Each of the four methods involves costly ducting, with the possibility of foam-over contamination.

Is It Worth It?

Nobody wants air pollution, but are wineries really a serious source of smog?

The evidence indicates otherwise. A recent study indicates that under certain atmospheric conditions, ethanol in the atmosphere may actually suppress ozone formation slightly. Under other conditions, ethanol may contribute to ozone formation, but not nearly as much as other volatile organic compounds (such as automobile emissions) commonly found in urban areas.

Available air quality data from the ARB on the Fresno area, where several large wineries are located, show no increase in ozone levels during the fermentation season, usually mid-August to October. In 1984, for instance, hourly violations of the ozone standard were highest in April and July. In 1985, the highest months were June and August. In fact, ozone levels actually decline during fermentation season.

In Fresno County, ethanol is less than 1% of total annual hydrocarbons and derivatives produced. The ARB has not found any scientific studies to demonstrate that ethanol from the fermentation process significantly affects ozone levels. Yet the proposed SCM would impose heavy costs on wineries.

The annual cost to affected wineries of the ducting alone is estimated to be $20/lb of ethanol removed. Control systems and disposal costs will raise the annual costs even higher. Compare that to $0.25–$1.50/lb annually to remove refinery petroleum pollutants, a known source of smog. Moreover, ethanol emissions from winery fermentation tanks already have been reduced substantially through lower fermentation temperatures. To spend the money to decrease ethanol emissions from winery fermentation tanks further is not cost-effective.

continued on page 6

SULFITE LABELING: How To Live With It

The inevitable has happened—with the new year came the reality of sulfite labeling for the wine industry. Effective January 9, 1987, to be implemented in a three-stage program, BATF's sulfite labeling rule affects all wines with a total sulfite content of 10 ppm or more.

The rule requires a disclosure statement which, at a minimum, must read 'Contains sulfites.' Other options involve lengthier terminology, such as 'Contains sulfur dioxide,' (or—in lieu of sulfur dioxide—sodium sulfite, sodium bisulfite, potassium bisulfite, sodium metabisulfite, potassium metabisulfite), or 'Contains (a) sulfiting agent(s).'

The rule does *not* require a warning statement, a statement of technical or function effect (*e.g.*, 'Contains sulfur dioxide as a preservative,'), or a total sulfur dioxide content statement. However, this information may be included if desired, *i.e.*, 'Contains sulfites. At the time of bottling, this product contained 100 ppm total sulfur dioxide.'

The rule is based on total, not free, SO_2, because BATF sanctions only those methods of SO_2 analysis approved by the Association of Official Analytical Chemists (AOAC). Currently, this includes only the Monier-Williams test. Other methods, such as flow injection analysis and a combination Ripper/aeration-oxidation method, are under consideration. The final rule does not distinguish between free and bound SO_2 as there are no AOAC-approved methods which test for free SO_2.

A statement of free SO_2 content is permitted only if it is immediately preceded by the total SO_2 content, and if it is in addition to the mandatory sulfite declaration. An example would be: 'Contains sulfites. At the time of bottling, this product contained 100 ppm total sulfur dioxide and 25 ppm free sulfite.'

Implementation of the rule will take place in three parts over a one-year period, as follows:

(1) As of January 9, 1987, all wine labels submitted for approval must bear the sulfite disclosure statement;

(2) Regardless of the date of label approval, any wine bottled on or after July 9, 1987, must bear a label with the sulfite disclosure statement;

(3) Finally, regardless of the date of label approval or bottling date, all wine removed from the bottling premises (or, in the case of imports, removed from customs custody) on or after January 9, 1988, must carry the disclosure statement.

As is the case with vintage date or net contents on a label, a previously-approved label need not be reapproved if the only change is the addition of the mandatory sulfite disclosure statement.

If a label is submitted for approval on or after January 9, 1987, for a wine which is believed to contain less than 10 ppm total SO_2, a sample of the finished wine must be forwarded along with the proposed label. The sample should consist of 10 bottles having a minimal net contents of 100mL each. BATF will analyze the wine prior to issuing the certificate of label approval.

Finally, and perhaps most importantly, how will this rule affect the appearance of wine labels? BATF has declared that the sulfite disclosure statement may appear on the brand (front), back, or neck labels, or may appear as a separate strip label. Required type size for the statement is not less than 2mm (1mm for 187mL packages). This places it in the same category as other mandatory information, such as class and type of wine. The statement may appear among other descriptive or explanatory information, but only if it is "of a size substantially more conspicuous" than that of the descriptive or explanatory information. Some examples of possible options follow.

On brand label:

> **Produced and Bottled by XYZ Winery**
> **Napa, California**
> **Alcohol 12.5% by volume * Contains sulfites**

On back label:

Following descriptive information, a separate line reading:

'Contains sulfites. At the time of bottling, this product contained 100 ppm total sulfur dioxide and 25 ppm free sulfite.'

continued from page 5

What Can You Do About It?

There are several things you can do. A public hearing to consider the SCM has been scheduled by the ARB for January 22, 1987. Before this date, *PW* advises you to write your local assemblyman or senator opposing adoption of the SCM.

Make yourself heard at the ARB meeting! Show up at the hearing and voice your opposition in person. The more winemakers and winery owners that pack the hall and oppose the SCM, the greater the chances of defeating it. For more information about the hearing, call the Wine Institute at (415) 986-0878.

If the SCM is adopted by the ARB, there will be a trickle-down effect. The ARB will ask local pollution control districts to implement the SCM. Make sure you are aware of what is happening at the local level and oppose the SCM at that level as well.

Maybe your winery has no 50,000-gallon fermentation tanks. You may be thinking, "I have nothing to worry about." However, once the ARB begins controlling winery ethanol emissions, they may not stop at 50,000-gallon tanks. One day, the size requirement could be lowered to 20,000 gallons, 10,000 gallons, 5,000 gallons, and even 60-gallon barrels—until eventually every California winery is affected. Don't wait until that happens. Act now.

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LETTERS TO THE EDITOR

Dear Editor:

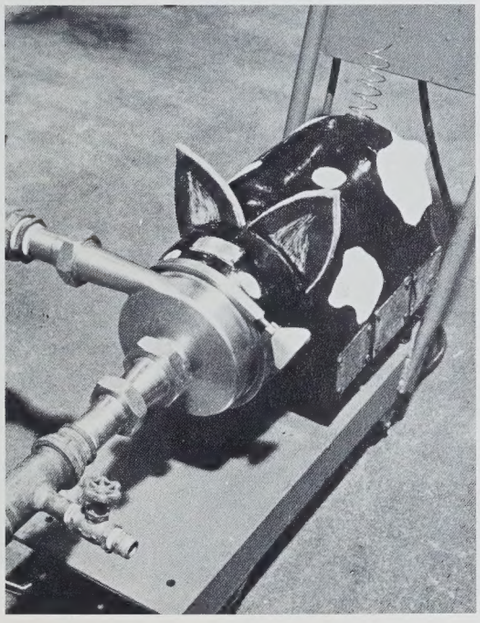
The Oregon wine industry has recently been in the limelight for the quality of our Pinot Noirs. However, we are also setting standards in the area of pump and equipment decoration.

Enclosed ia a photo of 'The Pig', a centrifugal pump named by our company president—even before decoration—for its prodigious ability to pump anything. 'The Pig' scoffs at pump-overs and blasts the fermentation caps of even northwest Pinot Noirs.

Equipment decoration does have a practical side as well (this *is PRACTICAL WINERY,* after all)—routine painting and maintenance are required for winery equipment, so why not turn the chore into a work of art that entertains the tourists, makes equipment recognition immediate, and warms the cockles of the cellar-rat heart?

Take up your paintbrushes, you owners of boring equipment—a challenge has been issued!

Sincerely,
The Cellar Crew
Sokol Blosser Winery, Dundee, OR



Tour guides at Sokol Blosser have made 'The Pig', Sokol Blosser's official entry in the Equipment Decoration Contest, a regular attraction for visitors. 'The Pig's' ears are made of 5/8" neoprene and are glued on. Sokol Blosser's cellar crew reports that, since they are "neat and symmetrical-type cellar rats, we do not drag our winery hoses willy-nilly and so have had no problems with his ears."

Dear Readers:

Well, there you have it. The glove has been tossed. Who will take it up?

PW supports the practical (to say nothing of the humorous) nature of the proposed Equipment Decoration Contest, and will offer a *free* one-year subscription (or renewal) to the winery with the winning entry. *Photographs of entrants must be submitted no later than May 1, 1987, in time for publication in the July/August 1987 issue.*

So that there can be no suspicion of favoritism on our part (you know we love you all), we'll let our readers be the judges. Photographs of entrants will be published with a ballot attached which readers can return to us with their vote for their favorite. The one with the most votes—WINS! Have fun!

Sincerely,
The Editor

Dear Editor:

Bucher Acquires Vaslin

Bucher-Guyer, AG, the Swiss manufacturer of fruit processing equipment, has acquired CMMC (Constructions Meca-Metalliques Chalonnaises), the French manufacturer of Vaslin destemmer-crushers, dejuicers, and grape presses. Marketing for both Bucher and Vaslin grape processing and winemaking equipment will be consolidated at CMMC in Chalonnes-sur-Loire, France. KLR Machines, Inc., the exclusive North American direct-factory representative for Bucher, will now also offer the entire line of Vaslin equipment.

KLR is pleased to add Vaslin to its growing product line of quality winemaking equipment and supplies which includes Bucher grape presses; Koch membrane systems crossflow filtration; Unipektin evaporators, essence recovery units, desulphurizers, and de-

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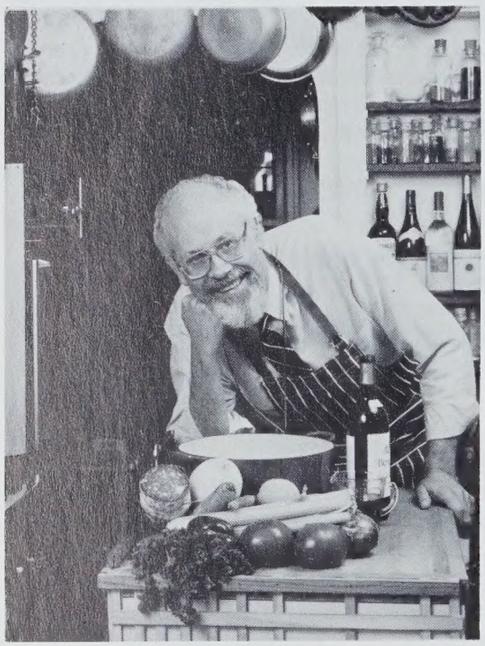
alcoholizers; WST bottling equipment; BECO filtersheets and filter aids; and Sanoplast PVC heat-shrink capsules. For further information, please contact KLR Machines, Inc., (415) 456-4774 or (607) 776-4193.
Ivan Linderman
KLR Machines, Inc.

BOOK REVIEWS



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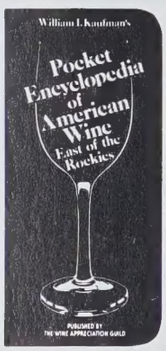

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The Frugal Gourmet Cooks with Wine
Jeff Smith
William Morrow & Co.; New York; $16.95; 447 pages

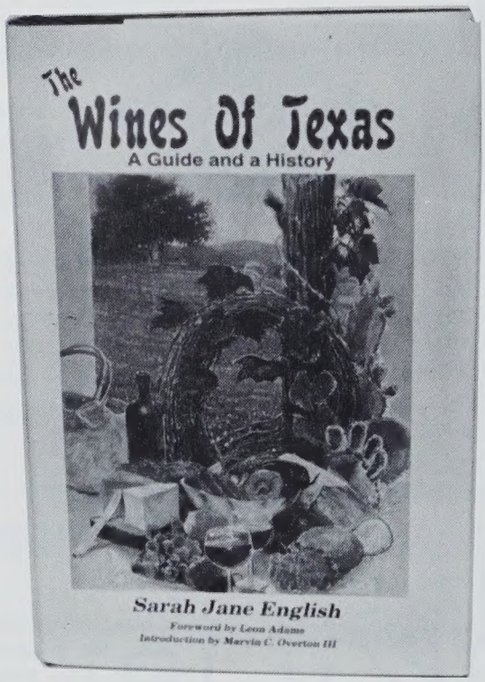
Jeff Smith's second book (after *The Frugal Gourmet*) approaches the subject of food and wine in a comfortable, relaxed, and conversational manner. More than a quarter of the book is dedicated to hints, equipment, cooking terms, and the basis of Smith's wine/food philosophy. With this background, even a novice will feel at ease with the subject matter.

According to Smith, the American wine industry is to blame in large part for romanticizing wine. He feels that this snobbery and pretension is what many people find intimidating about wine appreciation. Smith believes that the European 'wine is food' orientation is a healthier approach than America's puritan- and prohibition-based 'wine is liquor' approach.

Not all the recipes (and there are many) call for wine. The entree recipes include wine-serving suggestions – some based on tradition, some on logic, some from trial-and-error experience. Smith suggests drinking the wines you enjoy with the foods you enjoy.

The Frugal Gourmet Cooks with Wine offers something for everyone, whether your personal focus is on food, wine, or a marriage of the two. Both the novice and the aficionado will find this book helpful and, most of all, entertaining. If every winery promoted and sold this book to visitors, wine consumption in moderation could be increased.

* * *



The Wines of Texas
Sarah Jane English
Eakin Press; Austin, Texas; $12.95, 191 pages

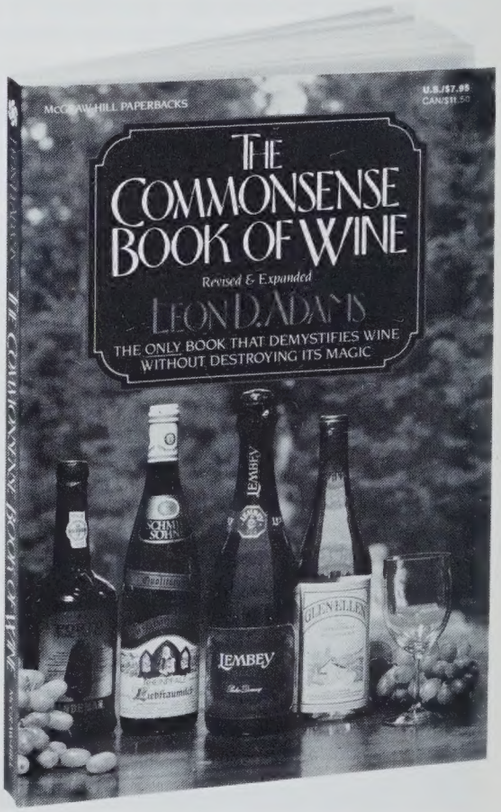
This comprehensive and well-written book covers the 19 wineries of Texas, divided into three major areas of the state: the Texas hill country, north-central and east Texas, and west Texas.

Each winery section includes a detailed history of the property, both before and since its days as a winery/vineyard, including extensive quotes from the present owners and others. Grapes grown and wines produced are discussed as well.

A food and wine section does an excellent job of pairing Texas wine styles with local cuisine. Menus such as Pollo Carbon served with Ste. Genevieve French Colombard or Dry Venison Sausage served with Cypress Valley Ruby Cabernet or Ranch Red bring out the best of southwest cooking.

Leon Adams wrote, in a foreword for the book, "Sarah Jane English captures in colorful detail the stories of the modern winegrowers who are making vinicultural history in the Lone Star state." This book is a must for anyone interested in learning more about one of the U.S.'s newer winegrowing regions.

* * *


McGRAW-HILL PAPERBACKS
THE COMMONSENSE BOOK OF WINE
Revised & Expanded
LEON D. ADAMS
THE ONLY BOOK THAT DEMYSTIFIES WINE WITHOUT DESTROYING ITS MAGIC
LEMBEY

The Commonsense Book of Wine
Leon Adams
McGraw-Hill; New York; $7.95; 166 pages

This latest edition of the wine drinker's bible, *The Commonsense Book of Wine*, has been revised and expanded, producing a book even more readable than previously. Expanded sections on restaurant wine-pricing and wine as the beverage of moderation, among others, have been added to address current concerns of wine drinkers.

The new edition in general is more attractive than previous editions, with a more sophisticated front cover and tighter, clearer page formatting. Any wine lover who is still without a copy of *The Commonsense Book of Wine* should waste no time in picking up this new edition. This is an especially good book for winery tasting rooms.

UPCOMING EVENTS

February 28, 1987
Powdery Mildew and Grapevines
Napa Valley College, Napa, CA

The Viticulture and Winery Technology Department of Napa Valley College will present a seminar on powdery mildew and grapevines in the campus Little Theater from 8:30 am–3:30 pm.

Speakers include Dr. James Marois and Dr. Doug Gubler, UC Davis Plant Pathology Department; Phil Freese, Robert Mondavi Winery; Will Nord, Domaine Chandon; and representatives of chemical companies producing fungicide materials for mildew control.

Enrollment for the seminar is limited to 250. The registration fee of $65 includes the seminar and lunch, with proceeds of the seminar benefiting the Viticulture and Winery Technology Program at Napa Valley College. Six hours of PCA credit will be available.

To register, send a check or money order for $65.00 made out to 'Napa Valley College Mildew Seminar' to Stephen J. Krebs, Program Coordinator, Viticulture and Winery Technology, Napa Valley College, Napa, CA 94558. Please include your name, address, and phone number with your fee. For further information, call (707) 253-3259.

January 30–31, 1987
Wine Industry Technical Symposium
Hyatt Regency, Monterey, CA

The 1987 annual WITS conference focuses on viticultural and marketing problems and their solutions. Marketing will be the topic on the first day, with a panel discussion on the practical aspects of distribution. Subtopics include 'Logistics–Getting It There' with Ron Groskopf, president, Groskopf Warehousing and Trucking; 'Economics–Cost Control and Cost Management' with Peter Andsell, Vintage Wine Merchants; and 'Legal Considerations' with William Kinzler, attorney at law.

The second day's program will include a panel discussion on yeasts led by Dr. Ralph Kunkee, professor of enology, UC Davis. Also participating are Linda Bisson of UC Davis; Dr. Gerald Reed, Red Star Yeasts; and Clayton Cone, Lallemand Yeasts. 'Old Bugs, New Problems' will be a discussion covering some of the pests and problems which vineyardists thought had been eradicated long ago. Dr. Alexander H. Percell III, associate professor of horticulture, UC Berkeley; and Laurie Wood, Freemark Abbey Winery will contribute to the discussion.

For more information, call or write WITS, PO Box 498, Geyserville, CA 95441, (707) 433-5349.

February 4, 1987
Wine Symposium 1987
Clarion Inn, Napa, CA

An all-day program concentrating on innovative techniques to help a business grow has been arranged by Price Waterhouse's Wine Industry Services Group. The group consists of audit, tax, systems and management consulting experts which specialize in maximizing the yield of wineries and vineyards of all sizes and types.

The first panel discussion will have Price Waterhouse tax professionals looking at the new rules in the 1986 Tax Reform Act. The second panel will include Greg Evans, V.P. of Finance at Robert Mondavi Winery; Ed Farver, V.P. of Finance at Domaine Chandon; and Bob Travers, President of Mayacamas Vineyards sharing strategies that have helped their businesses grow.

Bob Reynolds, Chairman of the Winegrowers of California, will be the luncheon speaker. After lunch, there will be small sessions dealing with legal strategies, when and how to use outside advisors, dealing with your bank, estate planning, inventory costing, microcomputers, the evolution from a start-up winery to a profitable business and much more.

The program will be from 8:30 am to 4:00 pm and include lunch. To attend, send a check for $120.00 to Price Waterhouse, 555 California St., San Francisco, CA 94104.

March 4–5, 1987
Pennsylvania Grape Industry Conference
Pennsylvania State University,
University Park (State College), PA

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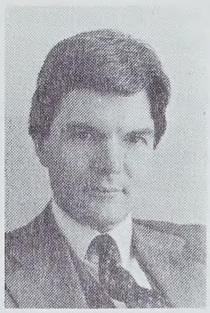

The Wine Lawyer

R. Corbin Houchins

Alternatives to the Pipeline

Canadian Broadcasting recently did a documentary on U.S. Senator Barry Goldwater.

It traced the development of the late-20th-century conservative movement in the U.S. from its first prominence under Goldwater as a lunatic fringe, through the immolation of the 1964 elections to the transfiguration of more or less libertarian conservatism into the set of beliefs which as Reaganism has become the dominant influence in national politics. Like many political topics (too many, probably), it set me thinking about regulation of wine.

A New Movement?

Rather than the familiar rags-to-riches-and-back story of Prohibition, the parallel that suggested itself had to do with direct distribution, which up to now has been still pretty much at the lunatic-fringe stage.

One should credit Jerry Mead with making a media cause out of freeing interestate wine commerce a bit for individual consumers. It could certainly do with some freeing.

As many readers of *PW* must be aware, the procedure for shipping into a state varies widely, but tends to express two basic themes: (1) Pay taxes, and (2) pay our distributors. Tax payment can be handled, theoretically at least, at the expense of dealing with considerable red tape for each shipment; state laws regulating the privilege to ship so that only licensed wholesalers might receive the wine from a winery are a bar to selling direct. [For a discussion of direct shipment and possible ways of dealing with restrictive laws, see *PW* Nov/Dec 1985.]

Enter Sandy Obester of Obester Winery, Half Moon Bay, CA, and Eric Seastrand with the suggestion that states pass laws removing a couple of cases a month for personal use from the tax/regulatory scheme that applies to all other sales and—the novel part—that the laws in essence challenge other states to follow suit. The challenge is inherent in a provision that a winery may ship directly into the enacting state only if its own state grants shippers in the enacting state the same privilege. That is what California has done by passing Assembly Bill 2723, which was authored by Seastrand.

Oregon had a similar bill pending at press time. Many observers had expected Oregon to have the first enactment—and quite possibly the last. Now it appears likely that two neighboring wine-producing states will soon be experimenting with direct shipment to consumers.

How It Would Work

The mechanism of exemption in the California law and Oregon proposal is extremely straightforward.

Shipment by anyone (whether winery, distributor, retail store or private individual) to an adult resident of not more than two cases containing not more than nine liters each per month for personal use and not for resale is simply not deemed a sale within the receiving state. The shipping container must be marked to indicate that it cannot be delivered to a minor or an inebriate. Presumably, regulations will be adopted to clear up some details, such as whether 'per month' means within a calendar month or a rate over time and what penalties attach to whom if the delivery instructions be disobeyed.

Note that the new law does not deregulate the shipments entirely. Obviously, they are still subject to BATF requirements. Moreover, there are numerous laws affecting wine that apply whether or not there is a sale. Even if Oregon enacts its bill, a Yamhill County winery could not, for example, lawfully send a couple of cases to the Safeway buyer in San Leandro.

Another thing the law cannot accomplish in itself is to create willing carriers to transport the wine at economically feasible rates. We will have to know how the transportation companies

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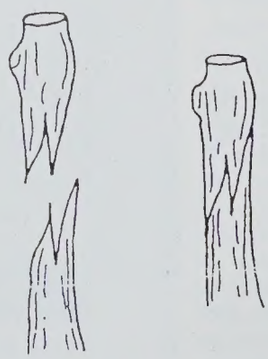

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respond to the legal issues, including dram shop exposure, before assessing feasibility.

Caveats

Legal pitfalls in the new law have to do mainly with existing or developing business relationships within the mainstream marketing structure:

1) *Distributor performance.* Few small wineries are able to induce distributors to enter into express agreements, but whether there are specific written or oral understandings or merely an ongoing winery-customer relationship, some thought has to be given to the impact of a new category of 'house accounts'. Even if there is no breach of an agreement, consider the effect on your distributor's willingness to represent the brand.

2) *The trade.* Small brands may be dependent on the good will of key bottle shops which are likely to perceive themselves as adversely affected. Large brands have their own marketing boffins to make such decisions, of course, but it would not seem wise for anyone to antagonize the major grocery chains.

3) *Effect of brokerage agreements.* Brokerage or field marketing services agreements may forbid direct sales or make the sales commissionable even if the broker plays no role.

Integration in Present Market

Conceivably, someone will find a way to integrate new opportunities for direct shipment with other elements of wine marketing.

One can imagine a role for direct case sales to consumers in a marketing plan carried on with contract brokers or missionaries, particularly for brands that are built largely with on-sale trade. On the face of it, the law would permit anyone to act as a field agent for the direct shipments, since there is no sale involved. Unless contrary regulations appear, there seems no reason why your waiter, bottle shop clerk or Tupperware party host couldn't proffer an order blank.

Future Developments

What place could direct shipment develop in the marketing of wine?

The answer is going to depend on the imagination and enterprise of marketers, the political clout of any gored oxen (tradition-minded distributors being the most likely group) and the sociological factors related to home purchases that have spawned direct mail boutiques like Sharper Image but which have thus far failed to produce a real revolution in retailing.

Harry and David?

Before major direct mail operators could get into the picture, they would have to believe in the potential and have a wholesale source of the product.

At a simplistic level, multiplying the number of wine consumers times 18 liters/month in the Portland ADI* produces a hefty increase over the current volume of the largest-selling California winery through its current distributor there. More realistically, there are doubtless producers in Oregon and elsewhere for whom the economics of selling in major markets through distributors (and possibly employing brokers besides, to compensate for lack of share of mind of the distributors) are marginal and to whom development of a direct wine marketing industry would bring benefits. California wineries already have, of course, the richest U.S. market within their own borders, but some incremental out-of-state volume couldn't hurt.

Assuming, as seems likely, that there is no lack of wineries ready to sell to national direct marketers if they get an appropriate license, there would be some legal glitches, mostly having to do with licensee eligibility laws that protect the middle tier. Realistically, if demand for high-volume use by heavyweight direct marketing houses develops, major political battles would have to be waged before it could be satisfied.

Like the political movement described on the radio, if it takes hold, direct sales will probably evolve in directions that cannot be foreseen. Still, I can't believe that any change that reduces restrictions on the movement of wine can be bad for the industry, and if change is to occur, the political sideshow should be entertaining in the extreme.

So let's wish the proponents of the measure in other states all the best.

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The Wine Retailer

Stan Hock

California Wine, in Segments

Hard times have illuminated the fact that the California wine industry is a collection of distinct markets, each one implicitly competing against the others for a share of today's shrinking wine dollar.

The biggest market segment, of course, consists of low-priced generic (jug) wines (75–80% of all California table wine sales), and it is this segment that has borne the brunt of the recent decline in per capita wine consumption. Although the underlying problem is the California wine industry's failure to expand its consumer base (contrary to the rosy expectations generated by the wine boom of the 1970s), there are sociological factors at work, too.

America's 'mood of moderation', embracing legal, moral, and health concerns, has prompted many people to abandon or severely reduce their consumption of alcoholic beverages. Individuals who once enjoyed a glass of chablis before dinner—perhaps another with their meal—may now be sipping sparkling water, fruit juice, or one of the myriad products combining the two.

Acceptance of wine coolers has diverted a younger generation of potential new consumers from the jug wine market, while older, more affluent baby boomers have traded up to inexpensive varietal wines (we're drinking less, but better). Although the decline of the dollar should give the domestic jug wine market a boost—by raising the price of competing imported brands—industry analysts do not expect this segment to rebound soon.

Wine coolers represent the newest and most spectacularly successful segment in the California wine market (eclipsing the performance of sparkling wines, which grew by 30% between 1980 and 1984, but have leveled out since). Cooler shipments leapt from 100,000 cases in 1982, when the white wine/fruit juice blends first appeared, to over 50 million cases in 1986, giving coolers an astonishing 30% share of the total California wine market.

The wine industry isn't sure what to think about this. On the positive side, the cooler craze has bailed out beleaguered Central Valley growers, who now have a secure home for their grapes and a reasonable prospect of making money again. Coolers have attracted millions of young people and minorities—groups that table wine producers have been unsuccessful in reaching—to a wine grape product. However, there's absolutely no evidence to suggest that these groups will graduate from coolers to table wine.

If they do, their first stop undoubtedly will be in the liquor store aisles devoted to blush wines, currently the fastest-growing segment in California's premium table wine market. Led by the vastly popular white Zinfandel, the blushers are the table wines closest in character to coolers (low alcohol, sweet, easy-drinking).

Wineries like Sutter Home (2.5 million cases of white Zinfandel in 1986), Beringer (second in white Zinfandel production to Sutter Home), and Fetzer (over 200,000 cases of assorted blush winers under the Bel Arbres label) have profited handsomely from the broad-based appeal of blush wines. Their success demonstrated to the industry (including many small wineries for whom blush wines have literally been a salvation) that this style of wine may be the industry's best approach to new and occasional drinkers.

Inexpensive varietal wines ($4–$6) represent another increasingly active segment of the premium table wine market. This category includes second labels (or alternate labels, as some wineries prefer to think of them), negociant wines, and private-label wines. It is growing rapidly as the result of a confluence of factors.

First, expanded production of California wine in conjunction with declining demand has produced a reservoir of quality bulk wine. Well-placed brokers and wineries have been able to take advantage of this situation to flood the market with good $5–$6 Chardonnays and Cabernet Sauvignons (at the same time that French wine prices are escalating).

Clearly, there is a huge market for these bargain varietals. Baby boomers who started out drinking Gallo and Almaden in the 1970s have traded up to varietal wines; yet, with new families and mortgages to support, they can't afford to drink the higher-priced bottlings on a regular basis; notable $5 wines are exactly what they're looking for.

The potential of this segment of the market is evident from the list of wineries and companies populating it. Glen Ellen Winery, which produces top-flight Chardonnay, Sauvignon Blanc, and Cabernet Sauvignon, has enjoyed enormous success with its line of $5 Proprietor's Reserve wines (primarily Chardonnay and Cabernet Sauvignon). Industry observers estimate Glen Ellen's production of these wines to be in the 350,000- to 500,000-case range, and they are widely distributed in both specialty shops and supermarket chains.

Beringer, acting as a negociant, has launched the Napa Ridge label with a 75,000- to 100,000-case/year production of varietal wines priced under $6. Franciscan also has made an impact with its Estancia brand, wines produced entirely from grapes grown in the winery's Alexander Valley vineyards. In 1986, Franciscan produced about 65,000 cases under the Estancia label, mostly Cabernet Sauvignon and Chardonnay, with a small amount of Sauvignon Blanc.

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Wineries generally considered exclusive boutiques have grabbed a piece of the action, too. Caymus, one of Napa Valley's most prestigious Cabernet Sauvignon producers, launched its Liberty School label a decade ago, but now ⅔ of the winery's 60,000-case annual production goes to market as Liberty School Cabernet Sauvignon, Chardonnay, and Sauvignon Blanc. Stag's Leap Wine Cellars, another famous Cabernet Sauvignon producer, made close to 60,000 cases of wine in 1986 destined for release under the Hawkcrest label, roughly 60% of the winery's total production.

Despite the phenomenal growth of the cooler, blush wine, and 'fighting varietal' markets (a phrase of John Skupny's, marketing director at Caymus), the most glamorous segment of the California wine industry remains its tiniest—the so-called 'super premiums', high-caliber varietal wines costing over $7. Actually, this segment consists of two categories—the super premiums, which cost between $7 and $15, and the prestige wines, which range between $15 and $50/bottle.

The latter sub-segment is dominated by brands like Jordan, Grgich and Chateau Montelena. It also includes 'designer' Cabernet Sauvignon from tiny producers like Dunn, Foreman, and Spottswoode, as well as the most expensive, reserve-style Cabernet Sauvignon bottlings from Heitz, Ridge, Mondavi, Beaulieu, Caymus, Stag's Leap, Sterling, and others.

It is within this prestige category that a very interesting development is now occurring, one radically at odds with the prevailing psychology of the industry's other market segments. This is the advent of selling futures.

In the July/August 1986 *PW*, this column reported that a Washington, D.C., retailer, Addy Bassin's McArthur Liquors, was offering futures prices on 24 California Cabernet Sauvignons and Merlots from the heralded 1984 vintage. McArthur's, one of the country's largest dealers in classified-growth red Bordeaux, modeled its offering after its Bordeaux futures program. By paying in advance for wines that were not yet bottled—and won't be delivered until late 1987 or in 1988—McArthur's customers could secure them at prices appreciably lower (theoretically, at least) than the eventual release prices.

By all accounts, McArthur's program was a big success and the store plans to continue it with future vintages. However, they've been beaten to the punch with 1985 California futures. Last fall, John Walker, one of San Francisco's oldest and most prestigious retail wine shops (like McArthur's a store with a national clientele and an active Bordeaux futures program), announced its own California futures program in full-page ads in *The Wine Spectator* and *The Wall Street Journal*.

The John Walker offering was larger than McArthur's, involving thirty wineries and over 6,000 cases of wine from the 1985 vintage. More than 2,000 cases were sold before the store held its public tasting of the wines in early November, 1986.

The wineries participating in the program sell their wines to John Walker at f.o.b. prices (the price they would normally sell to a distributor), and the store takes a slightly less-than-normal markup. This insures that the futures buyer gets the wine at a price below normal retail.

However, the asking prices for these highly-regarded Cabernet Sauvignons and Merlots, even on a futures basis, are strikingly high (Duckhorn Merlot was selling for $20/bottle, $2 above the standard retail price on their 1983 bottling; Stag's Leap Cask 23 Cabernet Sauvignon was $450 for a case of magnums). Obviously, many of the participating wineries are planning major price increases with their 1985 releases.

This inflationary tendency seems inherent in futures selling and it's one reason why retailers and collectors—and even the wineries participating in the Walker and McArthur programs—are concerned about its emergence in California.

On the other hand, most of the prestige producers feel the time is ripe to challenge the Bordelais' hegemony in this area. With two great vintages on tap (1984 and 1985) and prices for classified-growth Bordeaux skyrocketing, the Californians feel they can snatch some of the media attention—and dollars—the Bordeaux futures market has monopolized for the past five years.

Jayson Pahlmeyer, the wine consultant who put together the Walker program with owner John Hogan, put it this way: "The competition is with the French, that's what we're playing against; we're bootstrapping them [the California producers] into the same category as the first growths."

Putting aside the question of whether California's prestige Cabernet Sauvignons belong in the same category as the first growths (or the second or third growths, for that matter), there are practical matters to consider. American buyers went wild investing in 1982 and 1983 Bordeaux futures, but the outlandish prices being asked for the 1985s have quickly cooled their ardor (even yuppies aren't that stupid). By attempting at this point to appropriate the glitter of the Bordeaux futures market, California Cabernet Sauvignon producers may be grabbing hold of the tiger's tail just as the beast settles down for a good long nap.

In effect, these wineries—and the retail operations stage-managing their futures offerings—are hoping that the allure of futures buying (the thrill of securing a desirable commodity at a good price) will obscure the intrinsic worth of the products themselves (this certainly has been the key to the Bordelais' recent success).

One wonders if this is a healthy development in California. True, the prestige segment of the market is tiny and unique, its customers primarily wealthy collectors with little interest in other segments of the wine market (the reverse is also true). Perhaps futures selling in this segment has no effect upon the rest of the industry or on the attitudes of the average wine buyer.

Yet the masses of the American people ignore wine, at least in part, because they perceive wine consumption as an elitist activity: wealthy people speaking an esoteric language to describe an arcane ritual. The cooler, blush wine, and 'fighting varietal' segments of the market are, in effect, combating those stereotypes; futures selling perpetuates them, perhaps helping to ensure that wine drinking does remain an elitist activity in this country.

At this point, California futures look a lot like the anointed preaching to the converted and charging them through the nose for the sermon. It may fill one church's coffers, but it won't lure any of the heathen to the faith.

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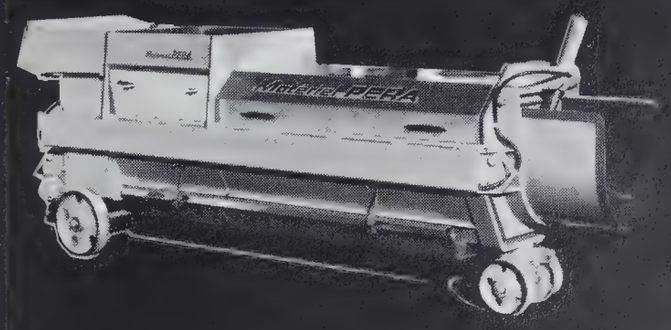

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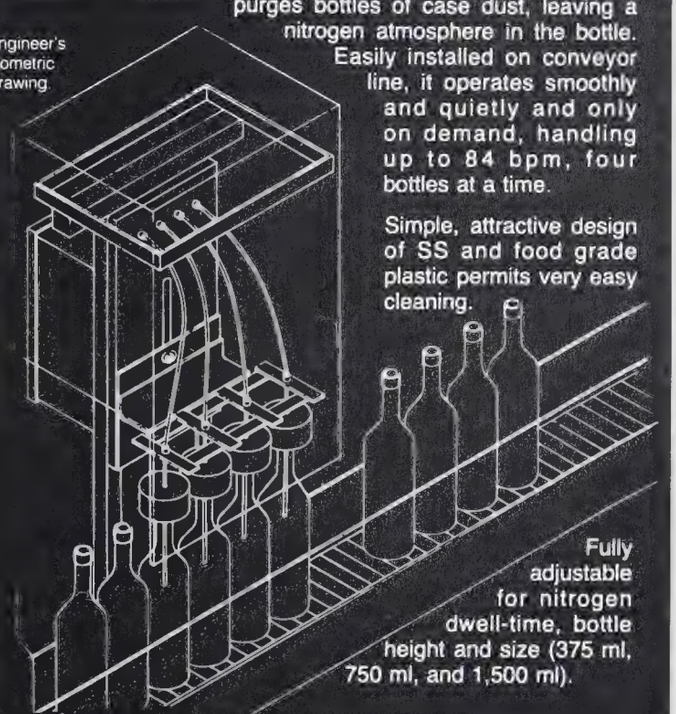

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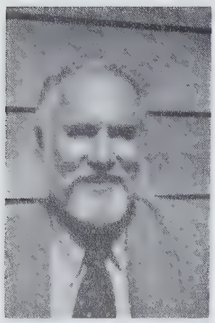

Winery Water & Waste

D.R. Storm, Ph.D., P.E.

Before the Cajun food craze goes the way of hula hoops and Edsels, I want to offer to PW *readers my pyrotechnic experiences with 'blackened fish'. Outdoor cooking becomes a necessity during the Sacramento Valley's summer, and I fully exploit this opportunity to give my family and friends the ultimate in barbecue experiences.*

Blackened fish, Cajun style, was the specialty last year, and besides contributing a large volume of barbecue smoke and pollutants to our precious air basin, I did manage to perfect the technique. I was fortunate in having a freezer full of Alaskan halibut with which to experiment, courtesy of my son's skill in landing an 80-pound monster between the mainland and Kodiak Island.

Barbecuing fish is always tricky, because well-done fish is, in my opinion, ruined, and blackening fish is several logarithms of difficulty greater than simple cooking over coals. The trick with blackening is the ability of the barbecue-master to ignite a butter mixture without incinerating the fish or setting the neighborhood on fire. This semi-controlled fish-fire is certain to bring "Oohs" and "Ahs" from both guests and horrified neighbors alike.

I must get on with the serious aspects of this column, but if you are interested in receiving a Ph.D.-tested formula for blackened fish, please send a stamped, self-addressed return envelope to 'Blackened Fish', c/o PRACTICAL WINERY, *15 Grande Paseo, San Rafael, CA 94903, and you will receive an easy-to-read recipe on fish seasoning and blackening and where to buy designer fire-retardant clothing—Enjoy!*

Water System Design Fundamentals

Water systems for wineries are, in my experience, the elements of the total utility network that cause the least operational problems. I have limited this discussion to the process water supply needs for a winery. Irrigation water systems will be discussed in a subsequent *PW* column. As long as there is adequate pressure and volume under full demand (usually at crush) and the chemical and bacteriological characteristics of the finished water supply are acceptable, no one complains.

A contemporary ultra-consciousness of the water we drink seems to pervade our society. What is in the water that we can't see or taste, and is it harmful? All are good questions now that there are federal and state statutes to give the maximum protection to the consumer. Very sophisticated analytical instruments permit the identification of chemicals to concentrations in parts per billion.

In other sectors of the beverage business where water is an essential part of the formula (beer, soft drinks, fruit juices from concentrates), the constituency of the water is certainly more important than it is to the wine industry, where water has very little, if anything, to do with the quality of the end product. Nonetheless, neither do careful winemakers want to use less than the purest, most sanitary products possible to clean tanks or soiled work areas. There are enough natural wine spoilage threats around without introducing more.

What is the System?

Urban or near-urban wineries have the easiest (though maybe not the most economical) solution for water supply if a public, quasi-public, or special district water purveyor is available to serve industrial and commercial customers in your particular area. Design decisions then involve only the identification of maximum demand for the winery, and, once established, the size of the meter and water service can be selected. Even if you are in a non-industrial/commercial area, the likelihood of finding any acceptable flow rate and line pressure, even in a residential location, will be very good.

Fire flow requirements generally set the control parameters for volume and pressure in any municipal water system, so that service for a winery, even at maximum winery demand, might only be impaired in the event of a major fire. The winery's water system for the latter example would consist only of the 'plumbing' (valves, pipes, and fittings) necessary to convey and distribute the water.

A simple but effective method for determining water demand (maximum flow in gallons/minute) for a winery can be found in the National Plumbing Code, current edition. If your winery is in the planning stage and you have retained a design professional, they can work with you to develop the pressure and volume requirements. Again, for a new winery, fire flows may govern the sizing for the principal supply lines and hydrant/sprinkler locations.

For wineries which must develop their own supplies from wells (groundwater) or surface supplies from springs or creeks, the 'system' becomes more elaborate. Water treatment enters the picture for surface water supplies. Many of the processes utilized in water treatment are familiar to the winemaker. Coagulation, flocculation, sedimentation, filtration, and disinfection are generally required for surface supplies to ensure bacteriological safety. Equipment selection and process design for water treatment are beyond the scope of this column. A qualified civil/sanitary engineer should be sought to plan and design a water treatment system.

Storage

The same logic that governs size of a municipal water supply system will also likely control the size of the main features of your on-winery water complex. For example, if you are serviced by a well or wells, some storage volume must be designed into the system to cover peak demands and to permit more efficient and economical pump operation.

Topography of the winery site can be a great help in achieving independence during a power outage or other mechanical/electrical failure of the pump. A one- or two-day supply of

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process water in storage at an elevation on the site high enough to produce adequate operating pressure and volume of flow can give peace of mind and a water system with a high degree of reliability.

If the winery is in a remote location and fire-fighting will be left to the winery, a storage tank full of water might save the structure and your inventory. Your insurance premiums, which have become a painful and significant part of a winery budget, can be trimmed in at least the fire protection category, if the storage philosophy is followed. Recommended fire flows and storage will be determined in consultation with your design professional, if you are still planning, or you can get an idea of preferred system design criteria from the Insurance Services Office (ISO) in your area.

This institute was formerly known as the National Board of Fire Underwriters. Their field staff rated municipal and special fire district systems by actually metering fire flows and pressures from hydrants. With these data, and an inventory of the equipment and manpower available to fight fires, the system was given a classification which set the fire insurance rates for all policies written within the area served by the fire department. ISO performs this same service today.

Noisy Pipes and Water Hammer

One of my pet peeves is the noise created by poorly-plumbed water systems. Otherwise beautifully-designed water systems, both residential and commercial, can emit excessive noise from improperly-sized pipes and pressure surges, known as 'water hammer'. This phenomenon, which can occur when a valve is closed quickly, produces a compression shock wave that travels throughout the piping system until it finally dissipates. Sonic booms, produced by supersonic aircraft, are the compressible fluid equivalent of water hammer.

Water hammer in very large systems can be destructive with the uncontrolled pressure surges rupturing pipes and damaging pumps. If water hammer noise can be traced to a conventional check valve on a supply line from a well, a damped check valve or a hydraulically-activated pump control and check valve could be installed and the noise abated. Inexpensive flush-type valves on non-water-closet-type toilets can also be a source of water hammer.

If water velocities in the pipe are generally kept under 15 feet/second, 'line noise' can be kept to a minimum. 'Line noise' is the unwanted alarm clock in motels and hotels that wakes you up when some earlier risers are performing their predawn ablutions. Water noise is really not a serious design flaw except that, to me, it is like owning a Rolls Royce that squeaks!

Pressure

Tank, barrel, floor, and equipment cleaning are the largest water-using winery chores. Most municipal systems deliver water to the meter in the range of 35–45 pounds psi. Good water works practice requires that, for large pipe networks, pressures be balanced, insofar as is economically possible. Excessively high pressure can be ameliorated with the installation of pressure-reducing valves. Low-pressure situations are more difficult to rectify and booster pumps, elevated tanks (see subsection on *Storage*) and hydropneumatic systems (storage tanks with air cushions) are often used to achieve better working pressures.

Wineries have an advantage in achieving adequate working pressure in the large number of in-house transfer pumps that are available to service special tank or barrel cleaners. The industrial grade 2- and 3-stage high-pressure pumps, with nozzle pressures of 2,000–3,000 psi, can be used to clean stubborn tartrate accumulations, and, as I successfully demonstrated recently with a 2,000-psi unit, to remove old paint from a wood surface.

Amos stemmer/crusher at Robert Mondavi Winery, Oakville, CA.

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The pipe network in the winery should be such that the pressure loss from the main supply line pressure is not more than 3 or 4% at maximum use. It is possible to make a quick check in the winery by the use of a simple Bourdon-type pressure gauge and the necessary pipe fitting, to allow you to check hose outlets at various locations throughout the winery. Remember that you are measuring *static* pressure and that dynamic pressure (when water is flowing through the pipe network) is going to be a couple of psi lower.

Before final acceptance of a new winery, it would be wise to perform the pressure test to see if the specified operating pressures for all the 'wet' winery equipment can be met. For example, we have a water-cooled condenser for one of our refrigeration units. The minimum operating pressure for the water supply is 35 psi. Several water towers 'riding-on-the-line' in our small community system and a new 1-inch meter and supply line from the street gives us the pressure and volume that is needed on a continuous basis.

Water System Ageing

One thing that you also might want to consider either in planning a new winery or in the operation of an existing winery is the loss in performance due to pipe ageing. Pipe network ageing is analogous to our own circulatory system ageing. A high-cholesterol diet may contribute to plugged arteries, just as 'hard' water precipitates (high in calcium and magnesium carbonates) can also accumulate on the interior of water pipes (usually more severe on the hot water side of the system).

The chemistry of carbonate deposition is highly influenced by temperature and pH. For example, in our winery structure (built in 1876), some of the water lines that we replaced were only 50 or 60% of their original diameter. This phenomenon can take an otherwise adequate supply pressure and reduce it exponentially (a half reduction in diameter can give pressure drops to the second power; in other words, the same half reduction in pipe size can increase pipe velocities four times, creating kinetic energy losses).

While we can reduce our cholesterol intake and stuff ourselves with fiber, the options to soften water are ion-exchange water softeners, or lime water treatment (the latter usually only economical for large volumes). For wineries with boiler systems, the use of soft water is essential to preclude expensive replacements of tube banks.

Ion-exchange softeners achieve the desired end effect but, in the process, exchange calcium for sodium ions. Sodium is also one of the chemicals for which human intake should be controlled. A separate system for drinking water might be appropriate, if ion-exchange softening is required for your winery's hard supply. (We once owned a tract home that delivered softened water to our lawn sprinklers and landscape, an unnecessary and expensive plumbing choice that I quickly changed.)

Give your winery water system the same attention your own cardiovascular network should receive. See your plumber once a year and eat plenty of bran. The system (and you) will perform for many years.

David Storm is a consulting sanitary engineer and owner of Winters Winery, Winters, CA.

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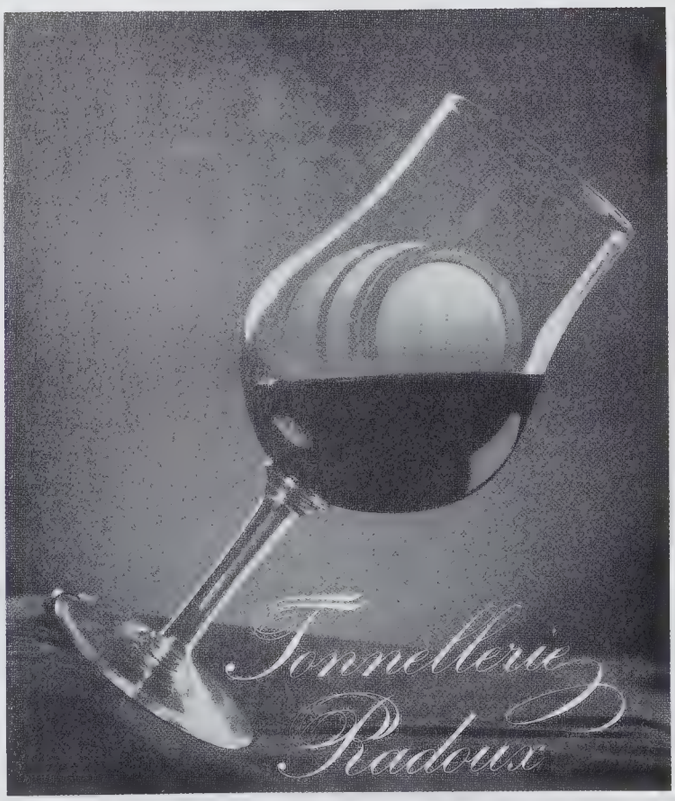

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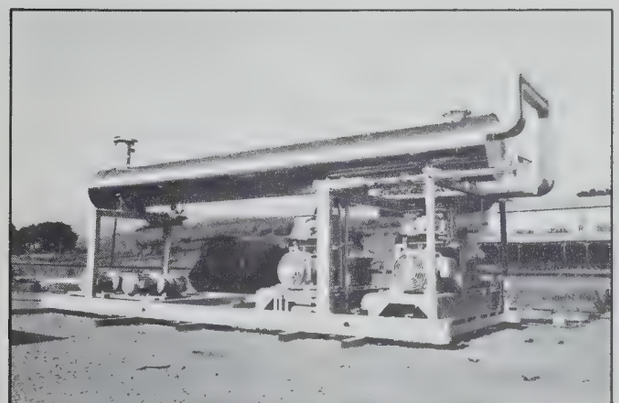

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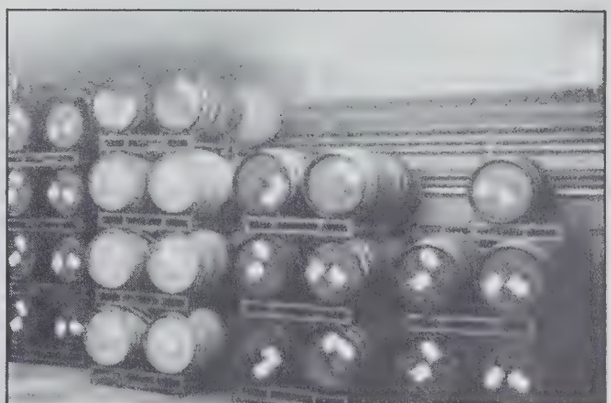

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Modifying Trellising for Improved Grape Quality

Several wineries in Napa and Sonoma counties are modifying trellis systems on certain grapes in an attempt to achieve improved grape quality. The wineries include Clos du Bois Winery, Robert Mondavi Winery, Robert Pepi Winery, and Sterling Vineyards.

Robert Pepi Winery

Robert Pepi has achieved a Sauvignon Blanc style which avoids the grassy, herbaceous character often considered a varietal trait. Pepi's original plantings included vines that were open and of only moderate vigor. The clusters were thereby exposed to a relatively sunny environment and appeared straw-colored or golden at maturity. The fruit had a floral, perfumed, citrus-like character.

In contrast, it was observed that grassy, herbaceous Sauvignon Blancs came from vigorous vines with dense canopies. The fruit tended to be located in dense shade and had a pea-green color. Resulting wines had a vegetal taste.

Pepi's original planting was ten acres done in 1970 on 8x10 spacing with a 24-inch crossarm. The vines are pruned to two canes and two spurs on a single wire 15 inches below the crossarm. The head is divided with one cane and one spur on each side and the spurs are 6–10 inches apart. The vines require a tremendous amount of labor to shoot-thin and crown-sucker to get light to the basal buds and achieve the desired fruit quality.

Pepi decided to expand Sauvignon Blanc production and replanted 17.5 acres in 1982 and 1983 to Sauvignon Blanc in deeper riverbed soil, which has a greater water-holding potential. To design the trellis, Pepi sought the advice of Richard Nagaoka, viticultural consultant, who had experience with vigorous Sauvignon Blanc plantings.

Jennifer Pepi and Richard Nagaoka inspect Geneva Double Curtain trellis system at Robert Pepi Vineyard, Oakville, CA.

Nagaoka cited his family's table grape vineyard in Lodi where the flavor and color of shipping grapes was better in the vines of lowest vigor. Tasting the berries exposed to the sun confirmed the improved quality. Specifically, he found that sun fruit when compared to shade fruit on even the same vine was not necessarily higher in sugar, but the titratable acid was generally lower.

Analysis showed that the tartrates were about equal; however, the malic acid was almost always lower in the sun fruit. Hence the fruit appeared mature as confirmed by the sugar/acid ratio. More important, however, was the taste, which could not be quantified. In Sauvignon Blanc, the correlation was apparent between shade berries, where weediness could be detected, and sun berries.

To position the fruit on new Pepi vines in the sun with less labor, the Geneva Double Curtain (GDC) trellis was chosen. After evaluating several trellis designs, Pepi decided on a 4-foot-wide crossarm at 60 inches aboveground. Since the vineyard was laid out with 10-foot rows and eight feet between vines, the space between curtains was only six feet, just enough to allow passage of tillage equipment.

The key to the trellis design is the manner in which the foliage turns upside down about early June. Since there is no foliar catch wire, the effect is to expose the fruit to direct sunlight for the balance of the growing season. Fruit exposed to the sun this early does not burn. Apparently there is some acclimatization if the event occurs early; in contrast, fruit exposed after berry softening during a hot day can burn in an hour.

It should be noted that some *vinifera* do not like to grow downward. By mid-season, some positioning of laterals is required to maintain the sunny regime. Without this effort, secondary shoots that arise from the main shoot tend to grow upright, resulting in a modest leaf canopy of one or two leaves over the clusters by harvest. This appears to be more than satisfactory in view of Alain Carbonneau's research in France, which suggests that GDC tends to overexpose the fruit.

The vines have been trained during the past three seasons and will be pruned to four canes, completing the framework for the 1987 season. Replacement spur positions will be located at the ends of the crossarms so that all fruit will be positioned at the top of each of the divided curtains.

The composition of 1986 fruit from Pepi's Sauvignon Blanc and Semillon (which is trained on a single-wire curtain, achieving similar fruit exposure) was evaluated by Jennifer Pepi, vineyardist. The berries sampled were selected from the same vines but from shade vs. sun positions within the canopy.

Analysis	Sauvignon Blanc Shade	Sauvignon Blanc Sun	Semillon Shade	Semillon Sun
Malic*	3.42	1.43	3.37	2.27
Tartaric*	7.92	6.76	6.33	6.15
T.A.**	0.93	0.80	0.74	0.59
pH	3.18	3.30	3.39	3.50
Potassium (AE)	1660	1920	1890	1900
Brix	22.9	25.0	21.6	22.6

HPLC by ETS Lab, St. Helena, CA
***Titratable acidity (phenolphthalein)*

The analysis disclosed the relationship of malic to tartaric organic acids between shade and sun positioning. Similarly, the results suggest that if the fruit were evaluated at similar Brix maturity levels, the sun fruit could reach maturity in terms of flavor at an earlier date.

Clos du Bois

Hughes Ryan, vineyard manager, has put in trellis experiments to achieve higher grape quality in Cabernet Sauvignon with better utilization of vine capacity and leaf efficiency.

In 1985, four rows of vines planted in 1974 on 8x12 spacing were converted from a two-wire vertical trellis to a 32-inch crossarm to get light to the fruit, improve color, and increase phenolic compounds, which are flavor components. "We want to improve leaf efficiency, and reduce senescence and early leaf fall," says Ryan. The increase in efficiency of the leaves should lead to earlier sugar and higher acid in the fruit. With better air circulation, spray applications will be better and needed less often. The 1985 yield increased 1.5 tons/acre.

In 1986, four rows were converted to Geneva Double Curtain and the remainder of four acres divided between a three-crossarm trellis with a flipper arm and a two-crossarm trellis. The bottom 30-inch crossarm will support the fruiting canes. The three crossarms also include a 72-inch crossarm on top and a 48-inch wide crossarm in the middle. The shoots will grow up to the higher crossarms to form two separate rows of foliage. This effectively doubles the length of the row over which the fruiting shoots can be spread. To achieve the conversion in 1986, the crown of the vine was suckered heavily at bloom. It will take one more season to form the canes.

Vineyard lots of 7.5 tons each were harvested in 1986 and analyzed as follows: grapes from a GDC cordon conversion in 1984 were 23.2° Brix, 0.89 TA, and 3.13 pH at an average yield of 10.62 tons/acre. The three-crossarm trellis block produced 26.0° Brix, 0.79 TA, and 3.19 pH at an average yield of 8.71 tons/acre. The control lot of two-wire vertical trellis produced 25.2° Brix, 0.92 TA, and 3.19 pH at an average yield of 5.76 tons/acre. Total phenolics were 1254 for the GDC, 1440 for the three-crossarm and 1423 for the control lot.

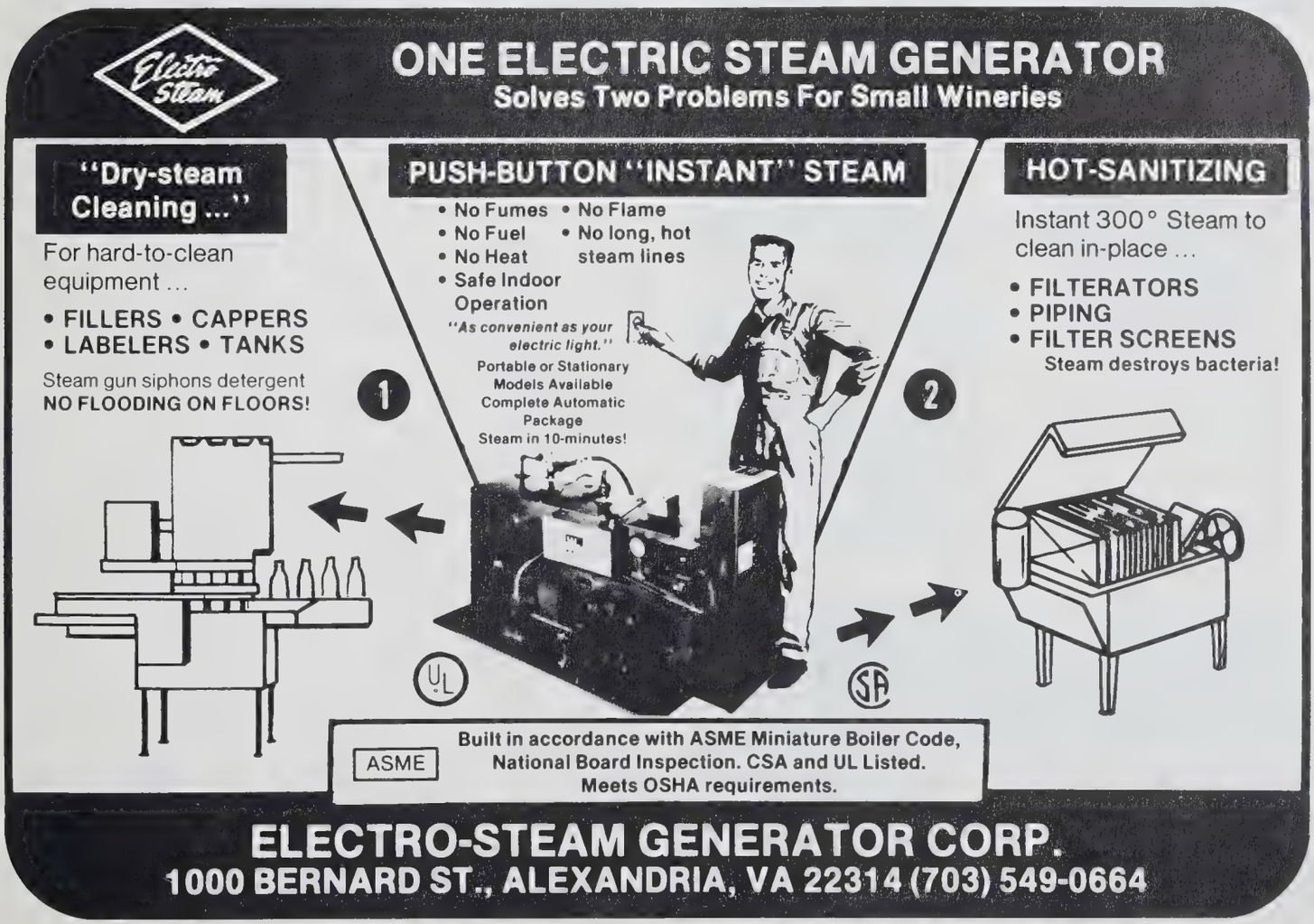
In 1985, 2.7 acres were T-budded to Merlot and two crossarms with a flipper wire were installed. A third crossarm will be added. Four acres were grafted to Chardonnay and two crossarms added to spread out the fruit, improve spray penetration and reduce rot potential.

Clos du Bois has spent almost $20,000 for trellis conversion by A & P Ag Structures. The winery has 475 total acres planted. Of that acreage, 85% is planted to Cabernet Sauvignon, Chardonnay, Merlot and Sauvignon Blanc, which are candidates for trellis conversion. Forty acres planted to rootstock were budded in 1986 and will require trellis decisions in the near future.

Robert Mondavi Winery

Eight acres of Merlot planted in 1972-73 in deep, very rich alluvial river-bottom soil adjacent to the Napa River at the Oak Knoll Ranch was converted to new trellis systems in 1986, according to Charlie Williams, vineyard manager.

The goal is to achieve better-quality fruit by getting more light to the fruit and foliage to increase color intensity and reduce malic percentage, pH, and herbaceous character in the fruit. Cluster-thinning experiments were done in 1983, 1984 and 1985, and a leaf-pulling experiment was done in 1986 without significant results.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Two rows of 85 vines were converted to a 'V' trellis, which is a spread of two posts with no crossarms to block potential mechanical pruning. The fruiting wires are 24 inches apart at 44 inches aboveground. There are moveable catch wires 36 inches apart at 56 inches aboveground on the inside of the posts that can be pulled up two positions. The top wires are 54 inches apart and 72 inches aboveground.

Four acres were converted to GDC with a 48-inch crossarm at 66 inches aboveground and a 10-inch kicker arm on each end of the crossarm.

Four acres were converted to a three-crossarm system with a 32-inch crossarm at 50 inches aboveground. The middle 48-inch crossarm is 62 inches aboveground and the top 72-inch crossarm is 76 inches aboveground.

"It will take us two or more pruning seasons to complete the conversion," says Williams, "and 3–5 years' evaluation before we might expand conversion to a total 35 acres of Merlot. Over $20,000 was spent on the trellis system conversion, including anchors and end posts done by A & P Ag Structures in 1986."

Sterling Vineyards

Trellis conversion is the latest experiment at the Sterling Vineyards' Peterson Ranch north of Calistoga, CA. The Cabernet Sauvignon grapes typically have had a high malic acid content (approximately 60%), low color, and a slightly herbaceous character; the resultant wine has had a high pH after malolactic fermentation. The fruit is currently used for Sterling's blush wine, Cabernet Blanc.

The vine profile is extremely high vigor in a deep, rich Aiken loam soil with a low yield of 2 ½–3 tons/acre. The low yields are partly due to blind buds, which are probably due to high nitrogen in the rich soil. "The vines are not balanced," according to Tucker Catlin, vineyard manager. "They are overly vegetative which creates a very low light regime that reduces bud fruitfulness and set even more. It is a vicious circle.

"In 1982, we started long-range experiments. We hedged at different times during one season to reduce the vegetation and improve the light regime. But hedging delayed ripening, probably because we stimulated lateral growth.

"We also tried pruning longer, leaving more buds/vine, which gave good results in the first year with increased yield, reduced malic acid content, reduced pH, and reduced potassium. The herbaceousness also seemed to be reduced in the experimental wines.

"We pruned the same way in the following year, but did not get the same results. We left six canes in the first year, which possibly resulted in too much canopy, preventing proper ripening of the wood for the following year.

"Next, we tried positioning the six canes on existing wires on a 24-inch crossarm in a GDC-like trellis and also tested shoot positioning at four weeks past bloom. We got sunburn and reduced color from the shoot-positioned fruit. In the following year we shoot-positioned at set and experienced no sunburn. Wine from non-shoot-positioned fruit in that year was pre-

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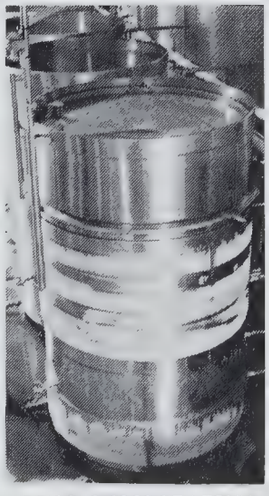

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Two-crossarm trellis at Clos du Bois Vineyards, Healdsburg, CA.

ferred as less herbaceous and was a richer wine against the vineyard control lot.

"In 1986, we had A & P Ag Structures install a ½ acre of a three-crossarm trellis system consisting of a 32-inch-wide crossarm at 42 inches aboveground, a 48-inch-wide crossarm at 54 inches aboveground and a 72-inch-wide crossarm at 76 inches aboveground. There is a 12-inch flipper arm on each end of the bottom crossarm for positioning shoots inside the divided trellis. A & P also installed a ½ acre of GDC trellis with a 42-inch crossarm at 61 inches aboveground. One-half of the GDC posts have a flipper-arm on each end of the crossarm to further test shoot positioning on a wider GDC system."

Sterling spent about $3,000/acre on materials and installation for the one-acre conversion. "This is about $1,500 more than we would normally spend, " adds Catlin. "But if we increase yield by one ton/acre, we will recover our additional costs in two years.

"Our primary goal with the divided trellis is to increase light to the canopy in order to increase crop which is needed to balance the extreme vine vigor. By balancing the crop to the vigor we expect to increase color, decrease the malic acid content, reduce the herbaceousness and enrich the resultant wine. Our goal is higher quality wine through higher yield/acre in this vegetative vineyard," summarizes Catlin.

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TAX REFORM *Impacts Wineries and Vineyards*

Greg Scott
Price Waterhouse

Wineries and vineyards face increased complexity and changes that will affect tax planning, operations, cash flow, and financial returns to owners as a result of the 1986 Tax Reform Act.

The act encompasses many areas. The following addresses only those of greatest significance to wineries and vineyards as a whole; there may be other provisions of the act which will affect your winery or vineyard. A careful review of tax and business planning and strategy is imperative.

Many winery or vineyard operations have been able, in the past, to reduce their cost of investment capital and/or enhance the return to the owners through tax benefits associated with the industry. The tax benefits available and the ability to pass these benefits to owners and investors have been substantially reduced.

Major changes include inventory accounting changes; longer depreciable lives; repeal of the investment tax credit; restrictions on the use of the cash method of accounting for tax purposes, including pre-productive costs; requirements to conform taxable years of partnerships and other pass-through entities to that of the owners; limitations on the use of tax benefits by those not active in the business; strengthened minimum tax provisions; and lower tax rates.

Inventory Costing

The wine industry as a whole has not followed any uniform approach to inventory costing. There has long been a requirement that the cost of inventory be computed on a 'full absorption' basis. This requires that inventory cost include not only the direct costs (grapes, bottles, corks, labels), but also an allocation of the indirect costs (labor, including supervision; utilities; depreciation of machinery and equipment; rent; property taxes; repairs and maintenance). To the extent that these costs were allocated as part of the cost of inventory which was still on hand at year-end, they were not available as a current period income tax deduction. Costs allocated to inventory are only deducted as cost of goods sold at the time the wine is sold and income from the sale is recognized.

The manner in which various wineries have costed and tracked the cost of their inventory has varied from those who (incorrectly) included only the cost of grapes in a broad category of inventory called 'wine' to those who have gathered detailed information on an ongoing basis to consistently and continually allocate detailed costs to each specific vintage and variety of wine produced.

The 1986 Tax Reform Act includes a provision requiring uniform capitalization rules. This includes a broader range of costs in those required to be added to the cost of inventory and not deducted as an expense until the wine is sold. These new inventory costing rules are applicable to your first taxable year *beginning* after December 31, 1986. (For those on a calendar year, this would be calendar 1987; for others on a fiscal year, this would be the year which begins in 1987.)

Inventory cost must now include:

Storage costs, including depreciation and taxes on any warehouses and the wages and benefits for warehouse labor. This would include cellar (post-fermentation) costs for those who followed the approach allowed by the courts for income tax purposes in Heaven Hill Distilleries. In the Heaven Hill case, it was held that the costs of barrel ageing for whiskey were not a manufacturing cost and did not have to be added to inventory cost but rather could be deducted currently for income tax purposes. The committee reports on the act specifically refer to Heaven Hill as an example of storage costs that now must be capitalized.

Costs attributable to acquiring inventory must now be included as part of the inventory cost. This includes freight in, wages and benefits of any employee who negotiates acquisition of grapes, bottles, or other supplies, and any other costs of a purchasing department.

Tax depreciation must now be added to the cost of inventory in full to the extent that it is attributable to property used in manufacturing or indirectly in support of manufacturing. In the past, one was only required to inventory for income tax purposes the depreciation inventoried for financial statement purposes; this meant that any accelerated tax depreciation in excess of 'book' or financial statement depreciation was available as a deduction in the current year.

General and administrative costs attributable to that portion of the business that is engaged in manufacturing must now also be allocated to inventory. This is a dramatic departure from past practice for both tax and financial accounting purposes. An example would be for the accounting or payroll department. Under the new rules, to the extent that the department supports another whose costs are allocated to inventory, the cost of that department would be allocated to inventory as well.

Fringe benefit and pension costs must now be allocated to inventory to the extent that wages are allocated to inventory.

Interest and financing costs must now be included in inventory to the extent that the inventory takes more than two years to produce, or to the extent that the production period is more than one year *and* the item(s) cost more than $1 million. The production period begins with the production of the property (crush) and ends at the time the property is ready to be held for sale. Controlling committee reports elaborate that "in the case of property such as ***wine*** . . . that is aged before it is sold, the production period includes the ageing period."

This means that in the case of wine for which the crush through ageing process exceeds the prescribed time limits, an allocation of interest to the inventory cost will have to be made. Whether this includes only bulk ageing or would be meant to include any period of warehousing in the bottle prior to release as part of the production period to determine if one exceeded the one- or two-year limit is not clear.

An important consideration is that while the above is required to determine 'cost', inventories, other than those on 'Last In-First Out' (LIFO), may be written down to the lower of cost or market. Additionally, these costing rules, adding significant additional costs to inventory, increase the need to review annually the potential benefits of a LIFO election.

Depreciation

The Accelerated Cost Recovery System (ACRS) has been modified by the act. The changes generally apply to property acquired and/or placed in service after 1986. For acquisitions after July, 1986, one may elect to apply the new rules. Depreciable lives are generally longer under the new system, but with the exception of real property (31.5 years straight-line under the new system), most winery and vineyard equipment will be seven-year property (formerly five-year).

This is not a significant change, especially when one considers that the act's percentage depreciation rates are based on 200% declining balance depreciation, as opposed to the 150% accelerated depreciation rate of the ACRS.

A number of transitional rules for depreciation apply for those who had a binding contract on or before March 1, 1986, to acquire property which is placed in service after 1986, depending on the type and life of the property. The transitional rules and the requirements which must be met to constitute a binding contract are lengthy. They should be reviewed by those who had orders for machinery and equipment or those who planted vineyards which have not yet become productive to determine if they apply to your particular facts and circumstances.

Investment Tax Credit

The Investment Tax Credit (ITC), which allowed a direct reduction in taxes payable for up to 10% of the cost of qualifying property placed in service during the year, has been repealed by the act. The repeal applies to property placed in service after 1985. However, here again many transitional rule provisions apply.

For property for which there was a binding contract, the credit may still be available if the property is placed in service by a range of dates which vary depending on the useful life of the property. For most winery and vineyard equipment, the property for which there is a binding contract must be placed in service before 1989.

Vineyards are not placed in service until the year in which they first produce a commercially harvestable crop. Therefore, if one had a binding contract or had planted vineyards before 1986, the credit may still be available.

The amount of tax which may be reduced by the credit has been reduced ($25,000 + 75% of tax in excess of $25,000) and the depreciable basis of the property will now have to be reduced in full by the amount of the credit claimed.

Additionally, there will be a reduction of ITC claimed under the transitional rules and ITC carryovers to reflect the lower tax rates. When fully phased in, the ITC will be reduced by 35%. This reduction is merely intended to allow the ITC to 'shelter' the same amount of taxable income from tax as before the rate reduction but not more. For example, at a 50% tax rate, $1 of ITC would shelter $2 of taxable income; after the rate reduction, $0.65 of ITC at rates of 28% to 34% will shelter $1.91 to $2.32 of taxable income.

Accounting Methods

The ability to use the cash method of accounting for tax purposes has been restricted. Wineries, as manufacturers, have always been required to use the accrual method, and many vineyard operations will continue to be able to use the cash method. Those who in the past were categorized as 'farm syndicates' or 'limited entrepreneurs' with respect to their vineyard (or farm) will no longer be able to use the cash method.

Farm syndicates and limited entrepreneurs are now classified as 'tax shelters' who may not use the cash method for tax purposes. Syndicates and limited entrepreneurs are entities which allocate more than 35% of their losses to those not active in the business, interests the sale of which would have been regulated by a federal or state agency as a securities offering, and any arrangement where avoiding or evading tax is a principal motivation.

The requirement for these taxpayers to change to the accrual method is effective for the taxable year beginning after 1986; any adjustment will be included in income in 1987 and future years. The period over which it will be included will be calculated as though one had requested a change in method of accounting. Use of the installment method to defer income may provide some relief, though this will have minimum tax implications which should be considered.

Taxable Years

Partnerships and subchapter S corporations (pass-through entities) will be required to conform their taxable year to that of their owners. Those pass-through entities with owners on differing tax years will be required to use the calendar year. There is an exception for those who can demonstrate a 'natural business year'. Calculations to determine if one has a natural business year will likely be mechanical and complex. Any double inclusion of income in one tax year or adjustment from the change to conform taxable years will be spread over four years, including the year of the change. This requirement is effective for the first taxable year beginning after 1986.

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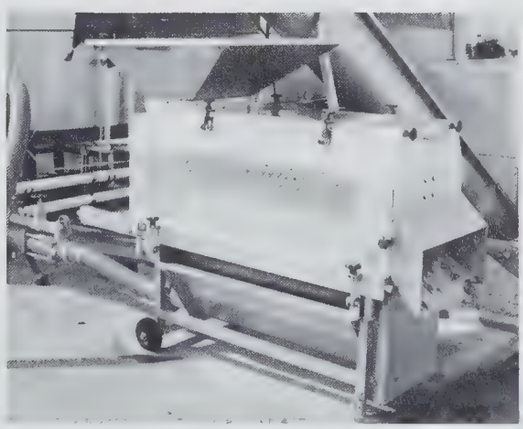

Rauch destemmer/crusher at Louis Honig Cellars, Rutherford, CA.

Passive Activity Losses

A new concept of categorizing income has been added with a restriction to not allow losses from those business activities in which one does not materially participate to shelter other sources of income from tax. Earned income (including income from activities in which one does materially participate) and portfolio income (interest, dividends, royalties, etc.) will generally not be able to be reduced by passive activity losses.

Rental activities (including rental real estate) will generally be passive. A limited ability to use rental real estate losses of up to $25,000 and transitional rules for those passive activity interests acquired before October 22, 1986, do exist.

The provisions for passive activity interests held before October 22, 1986, will allow 65%, 40%, 20%, and 10% of the losses which would have otherwise been disallowed from these interests in 1987 through 1990. Passive losses from one passive activity will, however, be able to be used to offset income from other passive activities before computing the disallowance.

Material participation to determine if one is active or passive will be determined by the level of activity in regular, continuous, and substantial business decision-making; whether the business is the principal business of the taxpayer; the proximity of the business activity to the taxpayer; and the knowledge and experience of the taxpayer.

Limited partners will be deemed to be passive in all instances. Exceptions apply to interests held by one spouse when the other taxpayer is active. This would also apply to surviving spouses and those who retired after being active in the activity.

Certain closely-held corporations (not subchapter S corporations) will be able to offset active business income of the company with passive income, but any portfolio income may not be offset by passive losses.

Minimum Tax Provisions

A new corporate Alternative Minimum Tax (AMT) will apply to taxable years beginning after 1986. The rules are complex and constitute a completely separate tax computation. The higher of the two taxes will apply and a complex set of offsetting credits of AMT applicable to timing differences will reduce the regular tax in future years when these same timing differences cause the regular tax to be higher than the AMT.

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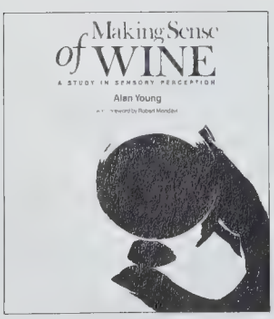

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Depreciation and gains and losses on property placed in service under the act will be computed for AMT under a different set of rules with differing lives and rates. Other items affecting the computation of AMT include accelerated depreciation on certain property placed in service under the old provisions; certain types of tax-exempt interest; and charitable contributions of appreciated property. There are other preference items. An additional item will be one-half of the excess of 'book' or financial statement over AMT income reflecting the adjustments and preferences above.

After a limited exemption, a 20% corporate AMT will apply. The use of credits and net operating losses will be limited in reducing AMT income as well. Elections will be available to avoid the AMT preference treatment for some items. An individual AMT has existed for several years and will require inclusion of many of the same preferences and computations as a result of the act.

Tax Rate Reductions

The act includes lower tax rates for all taxpayers, which are phased in through 1988. New maximum rates are as follows:

Corporations:
Through June 30, 1987–46%
After June, 1987–34%
Individuals:
1986–50%
1987–38.5%
1988–28%

Lower tax rate brackets do exist but are phased out for those with income in excess of certain taxable income amounts. Lower preferential tax rates for capital gains have also been repealed after 1986.

The higher tax rate for corporations over individuals is a reason for closely-held corporations to consider electing S corporation status. An S corporation election will result in the corporation's income being taxed at the lower tax rates of its individual shareholders. The election should not be made without a full review of all consequences, including the requirements of maintaining S corporation status (one class of stock, qualifying shareholders, inability to have subsidiaries, income requirements, and taxation of certain capital gains, among others); the fact that California and many other states do not recognize S corporation status; and the effects of the act's provisions, including the ability to use passive losses in a regular closely-held corporation.

Summary

The above only summarizes the major provisions of the act to wineries and vineyards. There may be other provisions which will be significant to you and your business. Some of the comments and conclusions may change as a result of subsequent legislative action, regulations to be issued under the act, and judicial decisions. Competent professional advice should be sought for planning transactions and for making any decisions as a result of the act.

Finally, it should be noted that California and some other states do not automatically follow federal tax provisions. California, for example, has had differing depreciation and farm accounting provisions in the past. California has not adopted these provisions. It is not certain when or if they will be adopted, and, if so, with what effective dates, and whether they will be adopted in whole or in part. Therefore, in planning under the act differences and discrepancies between federal and California (and possibly other states) in how one will compute taxable income is an important consideration.

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Marketing Techniques at Balverne Vineyards

Ray & Eleanor Heald

"Getting into the business was a natural extension for me because I come from five generations of farmers. I became interested in wine right out of college in the mid-1950s, when I swore I'd never go back to farming and began to pursue a career in advertising in New York City," says Bill Bird, president of Balverne Vineyards in the Chalk Hill appellation of Sonoma County, currently producing 25,000 cases annually.

He relaxed in his office chair to tell this story. "After five years in New York, I took a marketing job with Technicolor Corporation in California. Even in California, at that time, consumer interest focused on European wines. The first wine of any substance that I bought was an Hermitage from the Rhône.

"In 1961, I had the privilege of meeting Lee Stewart [founder of Souverain Cellars in the Napa Valley, now Burgess Cellars] and became intensely interested in California wines after I tasted his Pinot Noir. I shifted gears and worked in finance for a while. By the late 1960s, I decided that there was a genuine future for me in the California wine industry and started to look for land. I narrowed it to Napa or Sonoma County.

"The property now known as Balverne Vineyards came on the market in 1972 and by early 1973 a partnership was organized to buy it. The ranch had a history of grapegrowing from the turn of the century when Antonio Perelli-Manetti made the first plantings. It is 710 acres with 253 acres in vines currently, mostly planted in 1973 and 1974. There are seven named vineyards on the ranch and 38 separate plots. We crush about half the grapes for Balverne wines and sell the balance. The first estate crush was 1980.

Bill Bird conducts a directed tasting of three Balverne wines during a recent wine seminar at the winery.

"The old pre-Prohibition vines and Gravenstein apples were torn out, and we planted the varieties we needed (Chardonnay, Sauvignon Blanc, Semillon, Gewurztraminer, and Cabernet Sauvignon) to take advantage of the high-calcium soils, marine-influenced climate, and 400- to 800-foot elevations, which never see spring frost because of excellent air drainage.

"1982 was the last year we made Zinfandel. We now sell those grapes." Bird explains that when they planted Zinfandel in 1973, the Davis clone was used, a hearty clone more suitable for the Lodi area. He believed that if this clone was on a less rich soil, it would not bear as heavily and make a finer wine. As the style of Balverne wines emerged, these grapes did not make a consistently fine claret-style wine each year, and therefore Zinfandel is no longer in the portfolio. Only two Zinfandels were bottled by Balverne in five vintages.

Another wine, Healdsburger, was discontinued after the 1983 vintage. "We have always made a dry Gewurztraminer," he explained. "In the 1980 crush, a 2,000-gallon tank of Gewurztraminer stuck in fermentation at about 2% residual sugar. We could not get it restarted.

"Back then, we had some Scheurebe and Riesling and blended them with the 2% r.s. Gewurztraminer. We came up with a nice, fruity, 1% r.s. wine. When the blend was completed, the original 2,000 gallons had expanded to 3,000 that we had to sell. We gave it a Germanic-concept wine name, Healdsburger, after the nearby town of Healdsburg.

"Healdsburger was a mistake—we never intended to make that wine again, but demand forced us into it. How do you get a mistake to happen twice? One of the things we did when we were trying to restart the stuck fermentation was to age the Gewurztraminer in oak barrels. We had to do that again in 1981 after we stopped the fermentation at 2% r.s. to achieve the same style of wine.

"After a few years, it just became a matter of economics. We could not afford to use good cooperage to age sweet Gewurztraminer to produce a few thousand cases of Healdsburger, no matter how fast it sold. We were not making any money on it.

"Our vineyards tell us to produce Chardonnay, which is 50% of our production; Sauvignon Blanc blended with Semillon, about 6,000 cases; dry Gewurztraminer, around 3,000 cases; and the remainder, Cabernet Sauvignon. We release our Chardonnays the third year after the vintage, and the Cabernet Sauvignons are released after five years.

"In 1985, we made about 800 cases of Chardonnay in what is often called a Montrachet style. We did this after considerable research, including the cooper and barrel toasting level used to produce several of the Montrachets. Grapes for this wine came from one block of our Deerfield Vineyard. We haven't decided on the label, but we plan to hold this wine for 3–5 years before release. We believe that making small amounts of a special wine focuses attention on our overall Chardonnay program and gives it an added element of respect."

In a sense, Healdsburger marketed itself, but the four wines in current release by Balverne are marketed with strict, pragmatic strategy. The winery directly services accounts close to

home, in northern California, with two winery sales people. Southern California is covered by Wine Warehouse, who was chosen because of the broad size-range of wineries they represent and the large number of well-trained sales people. It impresses Bird that Wine Warehouse has people from other careers, *i.e.*, education and engineering, to name two, who have been trained in wine sales. The winery will probably turn its direct northern California accounts over to a distributor sometime in 1987.

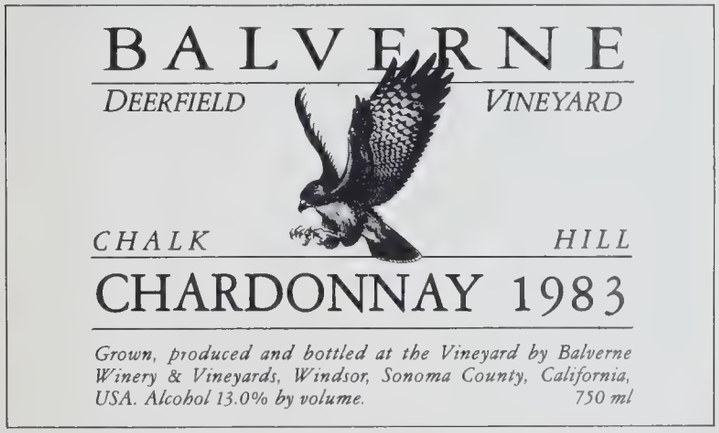
Bird believes that it is most important for a small winery, which he considers his 25,000-case size to be, to have distributors in large metropolitan areas who have a complete range of wines and who have their wines in well-respected restaurants. "If a wine sales person goes into a large hotel to sell wine," says Bird, "that sales person has more influence with a broad range of wines of all prices for the hotel's multiple dining facilities. If a distributor has only high-priced premium wines, or only low-priced wines without a balance between the two, chances are less for sales of our wine on a prestigious wine list.

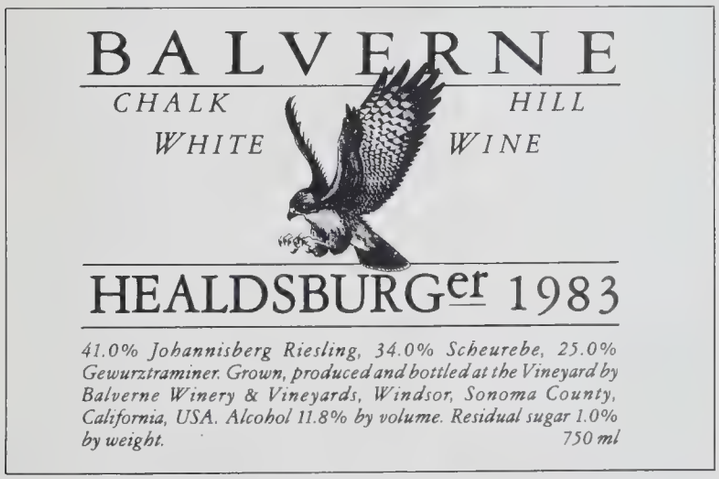
"Most of our wholesalers outside California are people who initially contacted the winery. They tasted the wine at a sales convention or during a vacation and wanted to sell it. To complement this, we have tried very hard to get into bellwether areas. I consider it very important that we have 26 accounts in the Grand Canyon and Flagstaff, AZ, areas. We are in such places as Lake Tahoe, CA; Deer Park, UT; Aspen, CO; Jackson Hole, WY; and Palm Springs, CA.

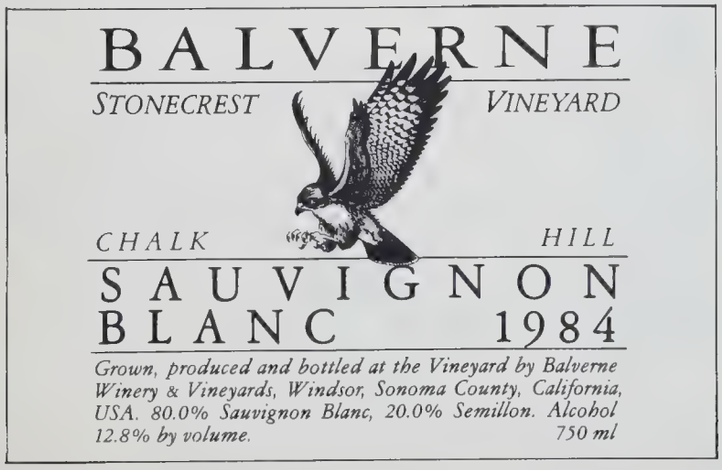
"These places are not just important in themselves, but potential accounts vacation there. You have to have your wines in places that cause people to notice you. The best of all possible worlds for a winery our size is to have people 'discover' our wine and feel they are one of the first to know about it. That's the way they become fans, advocates, and friends. Personal recommendations are very important.

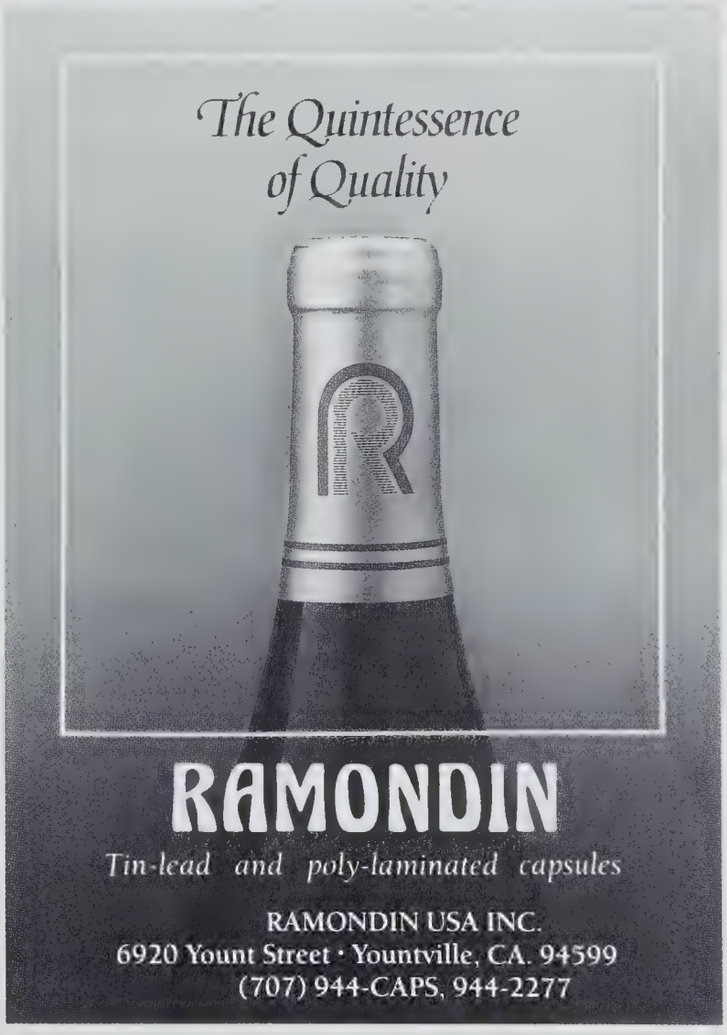
"We leave many decisions about placement of our wines in the hands of the agents we choose to market them. Restaurants are 70% of our marketing goals, including about 600 California restaurant wine lists. I have the philosophy that wines from a premium production winery are hand-sell items. 'Slick' advertising is not economically possible and would be counter-productive.

"A restaurant staff has to *sell* our wines, just as the owner or staff of a retail business must do. I don't believe floor stacks for wines such as ours work as a regular marketing tool. We need to be with knowledgeable retailers who personally endorse our wines. We ask that our distributors not place our wine into an account unless, in addition to the owner or manager, the staff has tasted the wine and been instructed about it. This policy is very compatible with the approach of successful distributors of fine wines. In states where it is legal, we ship, with each pallet of wine, samples marked 'Samples, not for sale' to be used for tasting.


BALVERNE
DEERFIELD VINEYARD
CHALK HILL
CHARDONNAY 1983
Grown, produced and bottled at the Vineyard by Balverne Winery & Vineyards, Windsor, Sonoma County, California, USA. Alcohol 13.0% by volume. 750 ml


BALVERNE
CHALK HILL
WHITE WINE
HEALDSBURGer 1983
41.0% Johannisberg Riesling, 34.0% Scheurebe, 25.0% Gewurztraminer. Grown, produced and bottled at the Vineyard by Balverne Winery & Vineyards, Windsor, Sonoma County, California, USA. Alcohol 11.8% by volume. Residual sugar 1.0% by weight. 750 ml


BALVERNE
STONECREST VINEYARD
CHALK HILL
SAUVIGNON BLANC 1984
Grown, produced and bottled at the Vineyard by Balverne Winery & Vineyards, Windsor, Sonoma County, California, USA. 80.0% Sauvignon Blanc, 20.0% Semillon. Alcohol 12.8% by volume. 750 ml



"This way, our distributors don't wonder if they should do this. We remind them, with each shipment, that this is what we want them to do. This gives a sense of winery participation in training the personnel selling our wines in large, key, on-premise accounts with tastings. We want wine-knowledgeable people selling our wine. For a winery of our size, the personal touch is most important.

"About a year prior to release, we inform agents of the exact number of cases that will be released for each of our four wines. About half of our Cabernet Sauvignon is sold as futures in California with the brokerage Russian River Wine Company and in New York through Morrell & Company. This works for us because we do indicate up front the number of cases and give certification to it.

"We did this for the 1981 Cabernet Sauvignon. Late in 1984, we informed our marketing people that we would release half as futures and that portion would not be released until October, 1986, when the balance, not sold on futures, would be released. The futures price was a reduction of 15%. All that we put up for futures was sold in six weeks, money up front, and it created lots of excitement about the wine."

Agents for Balverne wines have received release schedules into 1990 with growth projections for each varietal reflecting a winery growth to 32,500 cases. Predictions are updated as actual tonnage is known after harvest.

Bird has determined a niche in the market by what the vineyard has given as raw material. "Our vineyard did not give us a sow's ear," states Bird. "It gave us a silk purse. We, then, must be extremely careful to stylize the wine accordingly. We make wine by committee at Balverne and I only have one vote. Winemaker Mike Duffy orchestrates it in conjunction with three additional winery production personnel and some invited winery friends. In this way, we hope we are maintaining the style that builds the brand. We perceive ourselves as being in the upper 5% of California wineries based on quality and that places our wines automatically in about the upper 10% pricewise."

Balverne supply works as follows. All appointed distributors are offered an opening allocation based on production. Future allocations are based on performance. For example, if a distributor sells 5% of the current-release Chardonnay, he will be offered at least 5% of the next Chardonnay release before any new distribution is considered. Bird considers this 'strategic' planning. His aim is to have strong growth with the confidence of building a market that can be supplied. Balverne's growth rate has more than doubled since the first 12,225-case release in 1980.

"We have embarked on a program where winery representatives other than just myself travel to particular states to call on accounts," adds Bird. "For example, the period following harvest is not a particularly busy time in the vineyards, so we sent our viticulturist, Ed Kelly, on the road for several weeks. Everyone who works here needs to realize that this product must be sold.

"Since May, 1986, we have employed a regional agent in Denver to make calls principally on restaurant accounts. He markets video cassettes on how to serve and sell wine in restaurants. He markets his product at the same time as he is representing ours. If this is successful for us and our distributors in a tri-state market surrounding Colorado, we'll expand it to others who have similar employment interest. We view this regional position as an aid to the distributor in making sales and providing service to major accounts.

"We strongly believe in wine seminars," states Bird as he relates how he personally comes in contact with the wine-consuming public, particularly in California. On alternate weeks, a $159 ad is placed in the 'Datebook' section of the San Francisco *Chronicle* Sunday edition. There is only one paragraph in the ad: "Tour and tasting seminar and sales at remote Sonoma County wine estate. By prior appointment. Group and individuals. Plan two hours for this event. An entertaining and learning experience. Weekends only. For reservations, phone: 707/433-6913."

When people respond by phone, the winery secretary sets a weekend date to visit the winery for the tour/seminar. Guests are told that a carry-along picnic lunch will give added enjoyment. Visits are scheduled at 11:00 a.m. or 2:00 p.m. for between 10 and 30 guests. Phone reservations are followed up by a letter of confirmation.

The two-hour seminar consists of a brief tour, not so much to instruct people in how wine is made, but how Balverne wine is stylized by the winemaking staff and the equipment and general facilities they see. A directed tasting of three wines follows.

The advertising cost is recovered with the first couple in the earlier seminar session. Records indicate that the average couple buys $263 in wine that day. In addition, seminar attendees are invited to be on a special quarterly mailing list (UPS California only). Balverne sells about $20,000 in wine with each quarterly mailing to an 1,800-name list and an additional $40,000 from the same list during the holiday period, Thanksgiving through New Year's Day.

"People are making us a destination winery with this private-visitor program," concludes Bird.

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Present and Future of Central Coast Grapegrowing

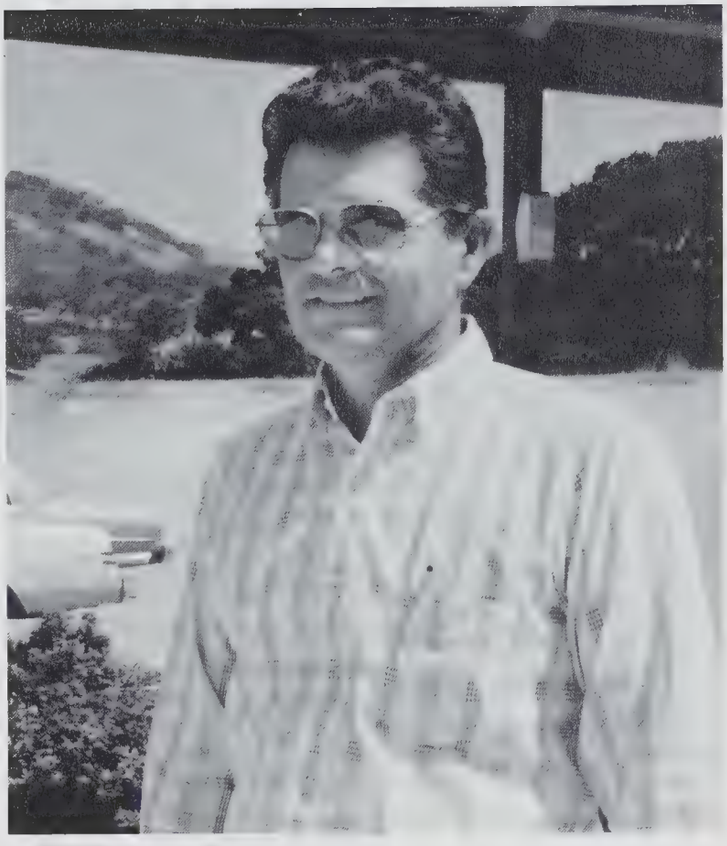
Joe Tarantino

While economic casualties among central coast grapegrowers and wineries in California are mounting, grower/consultant Dale Hampton sees better times ahead. But the good times will depend on current efforts to relocate grapes to proper microclimates and implement economically efficient farming methods, which will improve wine quality. Hampton, who was voted 1986 central coast wine industry Man of the Year by the Central Coast Winegrowers' Association, owns Hampton Farming, one of the largest and most prominent vineyard management companies in California's central and south-central coast. Hampton Farming will participate in these relocation efforts.

Successful management of vines, according to Hampton, is linked to the successful management of people. "Take any management without key people and you have zero," he says bluntly. "You can ignore grapes, money, everything. But you cannot ignore people. Conventional education and farming practice put too much emphasis on growing and not enough on how to communicate well with people; how to get the optimum from your employees and keep them well-compensated.

"I delegate authority. I talk in a general way to workers in the field, but I never criticize or try to change procedure. I let the supervisors do that. I will offer comments, but I use the supervisor's opinion as much as mine. It is very important not to criticize or change things in the field without the cooperation of the supervisor. It confuses the chain of command." Hampton Farming employs eight supervisors for approximately 5,000 acres. Most have been brought up through the ranks and are not college-educated. Among them, Hampton calls Michael Garcia, Mike Clay, and Larry Alexander "talented and efficient."

Hampton began his career in 1958 as a field inspector for DiGiorgio Company. One year later he became a field inspector for Ortho Chemical Company. From 1961–1970 he worked in the table grape industry, for George Lucas & Sons. He helped establish Tepusquet Vineyard in Santa Maria, CA, and stayed on until 1972, when he founded Hampton Farming. His responsibilities include Sierra Madre Vineyard, Firestone Winery's vineyards, Rancho San Antonio, and the 160-acre Piccho Vineyard, which will supply sparkling wine material for Maison Deutz. In the meantime, Maison Deutz cuvées are made from Hampton-managed vineyards in Santa Barbara County.



Dale Hampton, owner of Hampton Farming.

The Deutz venture represents a multi-million-dollar investment on the central coast. The success, or lack thereof, will influence growth in the region, particularly with regard to sparkling wine production. "The jury is still out on the details," says Hampton of the four-year-old vineyard, "but to date it

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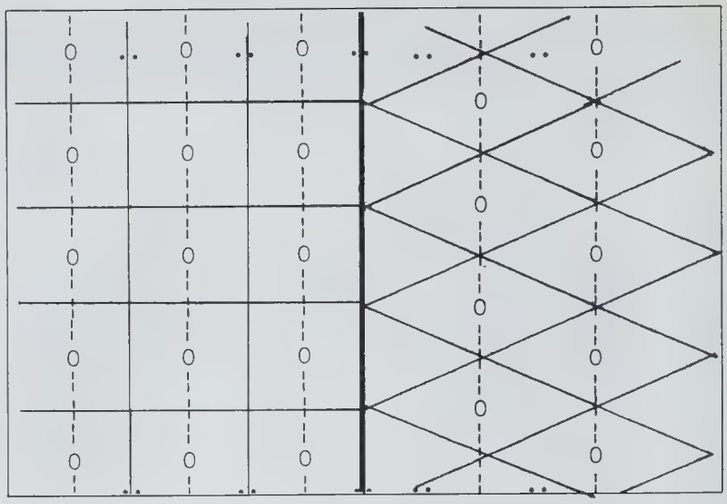
looks excellent to grow sparkling wine material." Located four miles east of the Pacific Ocean, in Arroyo Grande, the plantings by Hampton of Chardonnay, Pinot Noir, Pinot Blanc, and Chenin Blanc occupy two soils, Nacimiento silty clay loam and Diablo clay, with numerous variations due to uneven clay and limestone deposits. "I've been passing this plot of land for years," he says, "and I never thought much of it. Now I believe it was overlooked."

The reputation of the central coast has thus far been made on Chardonnay, Pinot Noir, and, to a lesser extent, Gewurztraminer, Riesling, and Pinot Blanc. "Farmers would do best by pinpointing ideal locations to raise these varieties," says Hampton. "We are grafting quite a bit, but it's being done slowly because of economic factors. There is a shift out of Sylvaner and Gewurztraminer in favor of Chardonnay and Pinot Noir. "We've even grafted Chardonnay onto Chardonnay. Two years ago, we replaced an unknown clone in one vineyard with the Wente clone. The first clone bore huge berries which broke easily and were too susceptible to rot.

"Chardonnay is the most popular grape in the spot market, outselling other varieties three to one. It's always been in heavy demand, but it was never overwhelming. Today I could sell twice what I have." There is a catch in today's market, however: wineries are waiting longer to place orders. Inquiries used to come in early January and February. Now they may come as late as August. Wineries are playing closer to the vest, monitoring inventory, sales, and consumer trends more carefully, because of overall sluggish industry conditions during the past few years.

The current slump will force many growers out, predicts Hampton. "It will be a small percentage here [San Luis Obispo County, Santa Barbara County]. We have many absentee growers who can handle the lows because they have other sources of income." He notes, however, that future plantings in the central and south-central coast will be limited.

"Financial institutions have bad memories of the situation," he adds. "They won't dump a lot of money into grape projects again." Hampton sees a greater shake-out in other California regions, particularly the Central Valley and Monterey County. He blames the crunch on overly-enthusiastic reports on the California grape industry in the 1970s, which encouraged speculation and too many lenient loans. Foreign investors further exacerbated the competitive pressures and oversupply which eventually developed.



Conventional planting (l); diamond planting (r).

Nevertheless, the central coast will be a survivor. "Quality grapes can be grown here every year," asserts Hampton, "once we understand the climate and the vines. We have to learn what grows best and where it grows best. We also need to determine what quantity achieves what quality. That may take us ten or more years."

Hampton believes that 5.25x10 vine spacing (830 vines/acre) is a better way to plant in the cooler coastal regions than most plantings now of 7x12. More vines/acre on the coast should yield fewer bunches, but better tonnage, a lower load/vine, but higher quality and good numbers. Hampton is examining the potential of large-scale diamond-shaped planting (four equal sides with two obtuse and two acute inner angles) to reduce vine competition and root overlap.

According to Vince Petrucci, a long-time associate of Hampton's who developed the diamond system in 1970 from research conducted at Fresno State University, the 12x8 format "allows roots to have a circular, not rectangular, growing pattern." (See figure 1.) Eighty percent of the root zone is contained in the first three feet of soil. A five-acre planting currently exists in the Santa Ynez Valley and Hampton is preparing to plant a 15-acre block adjacent to the Maison Deutz winery.

Spacing aside, Hampton prefers blocks of 25–30 acres. "Such blocks provide an edge in coping with the variables of nature," suggests Hampton. "Every vineyard and every problem is different. You have to be flexible at every ranch."

Currently, Hampton is trying to match canopy techniques to microclimate. "I wasn't big on hedging a few years ago," he says, "but now I am. My goal is to master canopy training. We

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used to do a two-wire and three-wire trellising. Now, we are trying a cross-arm to increase photosynthesis. I want to see what it does in cooler areas versus warmer areas where we practice the cross-arm now. A cross-arm allows the cane to develop better, permits more aeration, and, hopefully, better fruit."

Two hard-to-control variables, soil and climate, predominantly influence grape quality, according to Hampton. Farming practices, such as irrigation and fertilization, are wild cards, because each vineyard is unique and every farmer has a different method. "There is no sure way to minimize headaches," he says. "You must monitor the vineyards daily. Timing is the key to everything in farming. Timing comes with experience. They don't—maybe can't—teach it in school."

To manage irrigation, which Hampton considers the most critical quality determinate, Hampton Farming employs a full-time technical assistant and is making weekly use of a neutron probe, to measure inches/water per vine root/foot. In some cases, water needs can be accurately projected up to four weeks in advance. Hampton believes such precise water management improves grape quality, and reduces the risk and expense of overwatering. Typically, irrigation costs $20–25/acre.

Over the past five years, Hampton has tried to minimize fertilizers and maximize vine management. The vines are manipulated (via trellising, water management, pruning, etc.), instead of the soil. For example, about 15% of the vines at the Piccho Vineyard have been stunted by limestone deposits, near enough to the surface to tie up iron. But Hampton isn't worried about the deceptively young-looking vines, "Age will ease the problem. In the meantime, iron chelates and foliar spray are being used. I don't feel that fertilizer is as essential in grapegrowing as it was thought to be in the past. I encourage an in-between growth; not too vigorous, but not weak."

Unfortunately, nature often challenges man's well-intentioned plans and defenses as in 1986, when the central coast was hit by mildew. The mildew did not succumb, as expected, to Bayleton. An early bud break and slower-than-expected growth left the approximately-10" shoots vulnerable to mildew, according to Hampton.

Failure to effectively contain the problem caused about a 3% crop loss among vineyards he manages. "We learned that Bayleton is only a preventative and is not as effective alone as it is in combination with wettable and/or dry sulfur," Hampton noted. "A heavy, consistent application is critical. We will use wettable sulfur early with Bayleton, then use sulfur dust between applications."

Despite first-hand knowledge of the pitfalls of vineyard/winery ownership, Hampton put a lot of effort into the Byron Winery. The evolution of Byron, he explains, was a crusade against overly-strict Santa Barbara County zoning laws. In 1980, a friend approached Hampton seeking advice on the development of ten acres located southeast of Santa Maria. Hampton did not intend to participate in the venture, but, along with winemaker Ken Brown, got caught up in a long struggle to change the attitudes of local officials about wineries.

It took three years, from 1981 to 1984, to get Byron Winery a permit. "The county is tough on all permit requests," says Hampton. "They wanted to commercially-zone wineries and restrict where they could be located. Anyway, by the time it was all finished, I decided to get into it."

Hampton holds a one-third equity interest in the winery and its young five-acre estate Chardonnay vineyard. The investment has paid off. Byron debuted with two medal-winning 1984 Chardonnays and a superb 1984 Pinot Noir. Byron buys grapes from several sources, including vineyards managed by Hampton Farming.

The bottom line, according to Hampton, whether you are a grower or vintner, is the pursuit of better fruit. A good grower stays abreast of changes in farming and implements those changes, even if it means going against convention. An example is the availability of heat-treated vines in the early 1970s, which were expensive but also more disease-resistant. "A good farmer is always looking to improve quality," sums Hampton. "He is striving to grow the best grapes in the world. Once we can, as growers, do that, we can write our own ticket."

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Parkway Grill's Successful Wine Program

Ralph Hutchinson

Behind the bar of Parkway Grill, Pasadena, CA, sits a symbol of the success—and seriousness—of the restaurant's wine program: a barely-used eight-bottle Cruvinet. As a bartender explained, "We sell so much wine by the glass so quickly that, except for special items such as reserve Cabernet Sauvignons and late-harvest Rieslings, it's unnecessary to put opened bottles in the machine."

Parkway Grill opened in October of 1984 to instant acclaim not only by crowds of diners (who continue to fill the restaurant every night), but also by Los Angeles-area restaurant critics.

The wine list has 80 wines (71 Californian, nine French) offered on three pages in a 'triptych' folder which also contains a page listing mostly imported beers and California mineral waters. As the folder is opened, attention falls first upon a full page of wines by the glass—16 still wines and five sparkling wines and Champagnes. One-fourth of the wine list is poured by the glass, as well as by the bottle, at any one time. Table tents alongside wine glasses on each table list each wine poured by the glass. Approximately 20—25% of total wine sales are by the glass.

Bottle pricing is approximately twice retail (neither the more reasonable twice wholesale apparently favored by members of the wine industry and some restaurants, nor an exorbitant 3 X retail found on some wine lists). Prices by the glass are uniformly determined by dividing the bottle price by four, just as the bottle of wine is divided into four glasses of six ounces each and served in 9-ounce glasses. The per-glass price is less than what would be charged were the typical practice of pricing wine by the glass at 4 X wholesale to be employed.

In addition to Parkway Grill's wine-by-the-glass program, a second practice which helps to sell wine is that of offering a three-ounce 'taste' of each of the wines poured by the glass (with the exception of sparkling wines, Champagnes, and house wines). A 'taste' is priced so as to make two 'tastes' of the same wine cost $.25—$.50 more than one six-ounce pour.

Wines poured by the glass are changed at four-week intervals—so that regular customers might sample the entire wine list without buying a bottle. The entire list is evaluated, and changes are made when appropriate. When available vintages change, the list is updated to reflect the vintage being served, and as items are deleted, the list is kept current so as to avoid an 'out-of-stock' sticker.

An experienced serving staff helps Parkway Grill succeed in its wine program. The restaurant's management team follows a policy of hiring only waitstaff with three—five years' experience with wine service and similar cuisine.

Waitstaff training in wine is continuous. Each evening, the manager opens one or two bottles of wine from the list for waitstaff tasting, refreshing their memories of those wines. At monthly formal sit-down meetings, several wines of one varietal are opened, tasted, discussed, and evaluated for their qualities and for their compatibility with Parkway's cuisine.

Most customers choose their own wines. Whenever assistance is sought, a waiter or waitress feels confident in making recommendations or answering questions about a particular wine. For example, if a customer asks for an oaky Chardonnay or a grassy Sauvignon Blanc, there will be no hesitation in identifying a particular wine which exhibits the character sought by the customer. Confidence is built in the waitstaff both by the frequent tastings and by management briefings.

Management identifies the particular styles of wines on the list. For example, Sauvignon Blancs are noted as grassy and herbaceous (Chateau St. Jean's La Petite Etoile) or light and fruity (Frog's Leap). Particularly woody Chardonnays are identified (Sonoma-Cutrer Les Pierres), as are those which have little, if any, oak flavor (Flora Springs). The full, round flavor imparted by partial barrel fermentation in the Merry Vintners Chardonnay is pointed out, as is the restrained and 'elegant' style of S. Anderson.

Zinfandels are characterized according to whether they are zesty and fruity in the Beaujolais style (Grgich Hills) or full-bodied, mouth-filling, and astringent (Ridge Amador). Cabernet Sauvignons are described as ranging from light, fruity, and approachable (Beaulieu) to robust and full-flavored (even somewhat tannic, such as Duckhorn); from relatively simple (Gainey) to rather complex (Joseph Phelps Insignia). The sweetness levels and the presence or absence of fruity character of Rieslings on the list are noted.

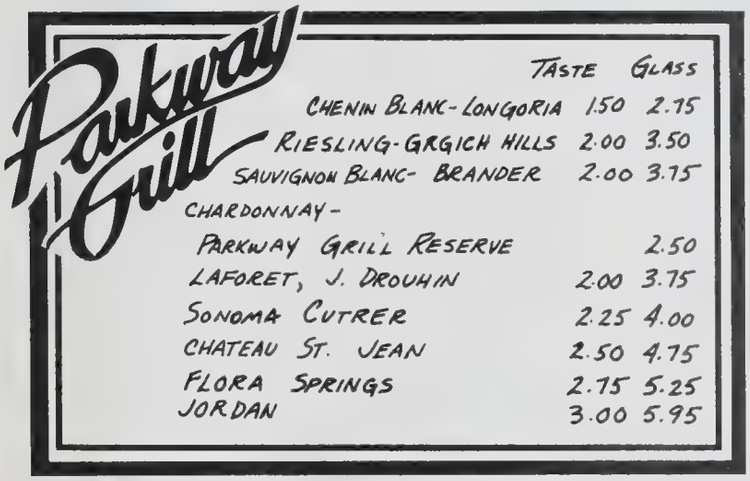
It is suggested that those Sauvignon Blancs with assertive herbaceous (or grassy or smoky) character may be paired successfully with the gourmet pizzas, with smoked ham, or with the tagliatelle with red and yellow peppers, where they will reinforce the flavors of the food. By contrast, the staff is taught that the softer, fruitier Sauvignon Blancs might be recommended with the shellfish appetizers—their fruitiness proving a foil for the spiciness of these dishes.

Other suggestions include the pairing of woody Chardonnays with applewood-smoked French hen, fruitier Chardonnays with the soft-shell tacos with snow crab meat, fruity Cabernet Sauvignons with beef tenderloin, and the more complex Cabernets with lamb. Fruity Rieslings are recommended with Cajun sausages to balance their spiciness. Fruity Sauvignon Blancs and non-woody Chardonnays are recommended with the catfish.

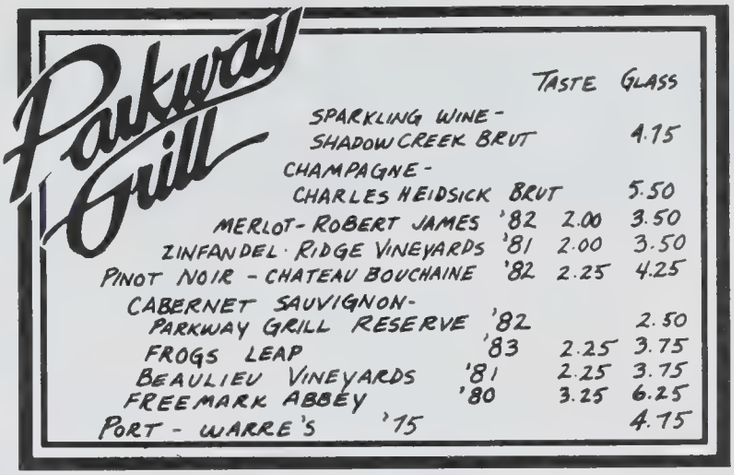
Manager Kevin Doherty is particularly interested in the developing quality of California Pinot Noirs. Consequently, members of the staff feel confident in recommending Pinot Noirs

with several dishes on the menu, particularly grilled dishes such as pork adovado, whose spiciness calls for a flavorful, but light, red wine (Beaulieu, for instance); duck in molasses and black pepper sauce, which is enhanced by the subtle hints of chocolate in some Pinot Noirs (Trefethen's, for example); or veal chops with peach-jalapeno chutney, whose gently-hot, fruity sauce combines well with Chateau Bouchaine's style, providing a unifying background for the combined flavors of the meat and the chutney.

A particularly interesting recommendation is a heavier Pinot Noir (Acacia Madonna, for example) or an assertive Cabernet Sauvignon (such as Silver Oak) with Cajun-blackened snapper. The dish requires a full-bodied, full-flavored red wine to stand up to its spiciness. As a result, Pinot Noir, frequently almost an orphan on many restaurant wine lists, sells well at Parkway—10 to 15 cases/month, split about evenly between each of the labels on the list, with the higher-priced ($23—$28) selling as well as those in the lower price range ($14—$17).



The wine list is divided by varietal, and, for each wine on the list, its region of origin and vintage are designated. In addition to the wines of well-known wineries, which make up the bulk of the list, there are two house wines, a Cabernet Sauvignon and a Chardonnay, labeled as Parkway Grill Reserve. These wines are made for Parkway Grill by San Antonio Winery, located in downtown Los Angeles, from central coast grapes. Each is priced at $10/bottle or $2.50/glass, and are the least expensive wines on the list. Approximately 50% of the wine sold by the glass at Parkway Grill is house wine. Each house wine is re-evaluated at six-month intervals to assure that quality remains high.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BEAULIEU VINEYARDS '81 2.25 3.75
FREEMARK ABBEY '80 3.25 6.25
PORT - WARRE'S '75 4.75

Although the house Chardonnay is not strongly aromatic, it does have a relatively fruity impact on the palate. Possessed of medium body, moderate acidity, and a hint of smokiness, this wine complements the bold flavors of the Parkway Grill cuisine. The house Cabernet Sauvignon is lightly aromatic, but clearly varietal in the nose. Although relatively light in body, this wine has pleasant herbal overtones and is softly astringent. The latter characteristic lingers in the aftertaste; this mouthfeel complements the spicier foods of the menu, but is not too much for the less spicy items.

Six wines in magnum and ten selections of older vintages of wines of especially high quality do not appear on the wine list. Limited quantities of any of these wines are available; however, they also serve a limited demand. The magnums may be offered to large parties of ten or more.

An example of such an occasion would be a wedding rehearsal dinner. The manager notes that large bottles not only make an impressive appearance on the table, but also represent good value, being typically priced at $5 less than twice the price of two regular (750 mL) bottles.

Older vintages include Cabernet Sauvignons from Stag's Leap Wine Cellars Cask 23, Far Niente, Silver Oak, and Jordan. These wines are in limited supply, but they fill the need for a few special bottles for special occasions. Although rare, and not replaceable, these wines are priced at wholesale plus a flat markup of $15/bottle.

The menu's *à la carte* nature is such that a diner may make up a satisfying meal solely from salads, appetizers and pastas. A typical party of four may order individual appetizers and/or salads, split a pizza or two (or perhaps split a pasta dish in lieu

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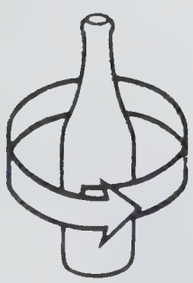

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of a second pizza) before moving on to a main course. The menu invites such 'grazing', as it is sometimes called, and the sharing of tastes by diners.

For this reason, the fact that the most expensive wine on the list (Joseph Phelps 'Insignia' at $49/bottle) is priced at nearly three times the most expensive main course (the veal chop at $19.50) appears to be irrelevant. Those 'guidelines' which suggest that the most expensive wine on the wine list ought not to cost more than the most expensive item on the menu do not apply at Parkway Grill. A more appropriate comparison is between the average price/bottle of wine and the average total food expenditure. When the average expenditure for appetizers plus pizza or pasta plus main course is added up, it averages between $28.50 and $30.00 per diner. From this analysis, the average bottle price is clearly in line with the average food expenditure.

In any case, the average price of main courses is just over $14, and the average bottle price of still wines on the wine list is approximately $21, not a disproportionate ratio. The range of wine prices is such that there is a glass or bottle price to match every menu selection by a diner.

The management believes that quality of the wines on Parkway's list is more important than price to their customers. Both the wine list and the menu are planned in accordance with this belief. The wine list is designed to accompany the restaurant's cuisine and to accommodate diners who wish to taste several wines with their meals. Consideration has been given to the diverse nature of the food offerings and to the selection of some wines which will complement and balance spicy and/or hot foods (*e.g.*, Pinot Noirs with blackened fish). Other choices will reinforce the flavors of foods such as those with bell pepper as a dominant note or smokiness as a noticeable characteristic.

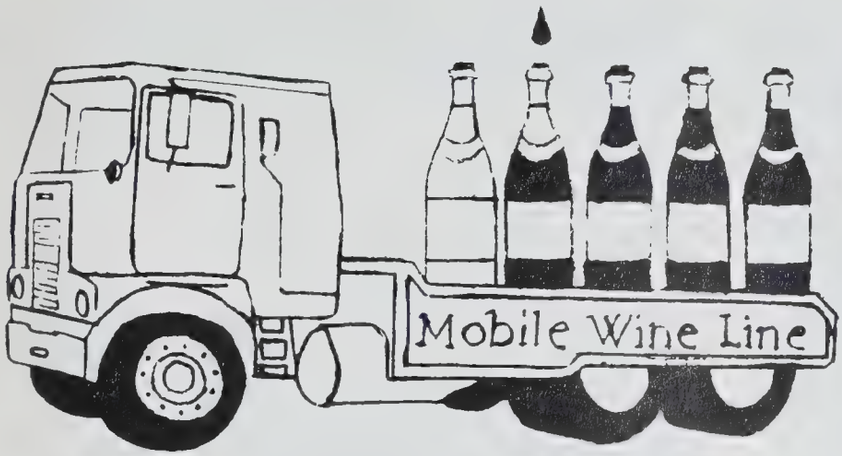
Wine glasses are promptly refilled, often resulting in the sale of an additional bottle. It is a central tenet at Parkway Grill that prompt, attentive service sells wine.

The waitstaff has also been trained to 'sell down'. This means that if a glass of wine will suffice to accompany the last few bites of a dish, the server suggests a glass rather than an entire bottle. If the diner has been enjoying wine by the glass, an additional glass—or a taste—may be suggested.

Wine is more important in the overall sales picture of the restaurant than are mixed drinks, which represent a relatively small part of the bar business. For example, on average, liquor accounts for approximately 30% of an evening's bar business, and a substantial portion of sales of distilled spirits are of cognacs and after-dinner liqueurs. White wines are stored at 55°F and red wines at room temperature (approximately 65°F).

Vintage ports play a small but important role in the wine program at Parkway. Usually two ports are offered, one of a relatively recent vintage and one of an older vintage. For example, the 1980 Warre's was offered recently at $4/glass and the 1963 Graham's was being poured at $12/glass—for three-ounce servings. Purchases are made in relatively small quantities, which permits the selection to be changed frequently.

Approximately 18—20% of the net income of Parkway Grill is derived from wine sales, most of this generated in the evening dinner hours. An important 10—12% of wine sales are made at lunchtime. These figures reflect Parkway's careful selection for the wine list, a strong wine-by-the-glass program, hiring and continuous training of experienced waitstaff persons, and an emphasis upon quality and attentive service. The outcome is that an average of 1.5 glasses of wine are consumed per customer, and approximately 20% of each check represents wine sales.



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Question #1 is whether the grapes shall be crushed before or after destemming, if further crushing is required beyond that which happens naturally in the destemming operation. The goal of most winemakers is to simply split or crack the grape skin without tearing up the grape or macerating the stems.

Question #2 is the capacity required for your winery's needs. All capacities given below are approximate and will vary based on the variety and condition of grapes to be de-stemmed and/or crushed. The key to machine effectiveness is the speed and design of the equipment with respect to the stems; the goal is to avoid cutting them, which would release bitter herbaceous flavors.

Practical Winery cannot recommend any particular machine to fit all grape situations. Each winemaker must make the machine choice that best suits the winery's wine style. Some machines can be adjusted to produce more than one type of must from different grapes. Many choices are listed below. If a new destemmer/crusher is in your future, please contact the following suppliers and mention having seen their information in *PW*.

The Compleat Winemaker

Three manufacturers are represented.

The *Cingano* destemmer/crusher with two fixed rubber rollers has framework and contact parts of all-stainless-steel construction, with an American motor and electrical controls. Cingano models and capacities are:

Model P.O.S. 01 – 10 tons/hr
Model P.O.S. 0 – 12–16 tons/hr
Model P.O.S. 1 – 22–28 tons/hr
Model P.O.S. 2 – 44–50 tons/hr
Model P.O.S. 3 – 90–100 tons/hr

The Italian *MEAAT* crusher/destemmer has stainless steel contact parts with adjustable plastic rollers and an auger feed in the grape hopper. It is motorized with a single-phase American motor and has a two ton/hr capacity. The model DVP 35 destemmer also has an auger feed in the grape hopper and auger feed in the collection basin. The destemming screen can be partially removed and there is a must pump outlet with a 2hp American motor. Capacity is four tons/hr.

The *S.I.P.I.* hand-crank model can handle 1.5 tons/hr. A motorized unit can handle two tons/hr.

Inquiries to: The Compleat Winemaker, 1219 Main St., St. Helena, CA 94574, (707) 963-9681.

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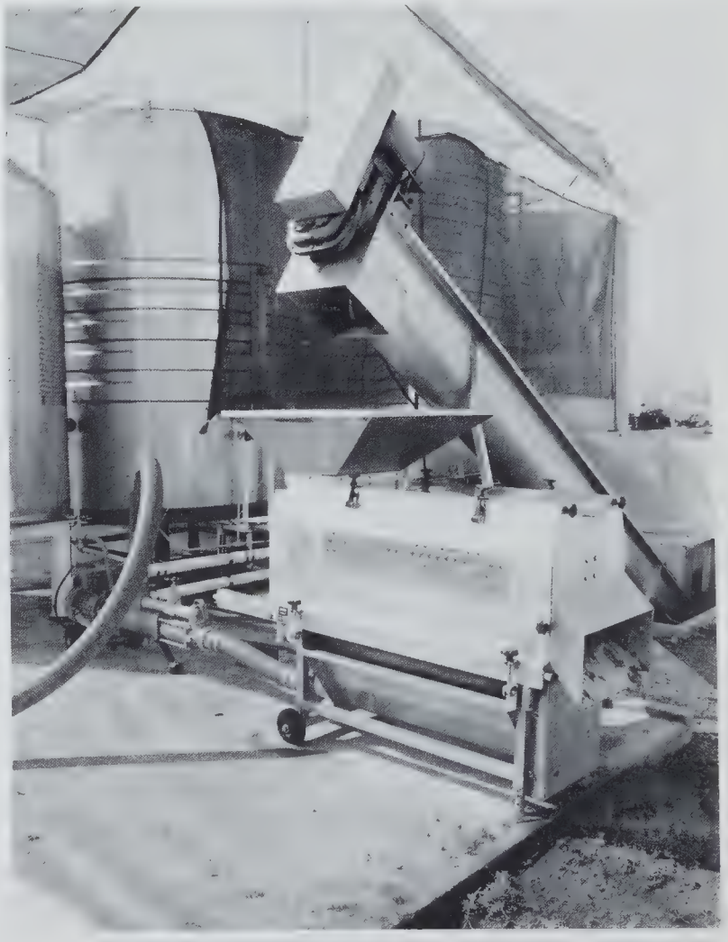
Cingano destemmer-crusher at Lakespring Winery, Yountville, CA.



Rauch destemmer-crusher at Louis Honig Cellars, Rutherford, CA.

Fischer Winery Equipment

The *Rauch* destemmer/crusher model AU 8 with a frame, hopper and base of all-stainless-steel construction and adjustable rubber rollers can handle 10–12 tons/hr. For difficult-to-destem grape varieties, the pitch of the destemmer/crusher can be changed to increase the retention time in the drum. Stems are expelled from the destemmer/crusher before becoming macerated or coated with juice. The destemming cylinder, made of Polyamid, can be removed to use the unit as a crusher only.

Inquiries to: Fischer Winery Equipment, 930 Dowdell Lane, PO Box 607, St. Helena, CA 94574, (707) 963-7000.

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Vaslin destemmer-crusher at De Lorimier Vineyards, Healdsburg, CA.

KLR Machines, Inc.

The *Vaslin* destemmers have all-stainless-steel construction. There is a door on the destemming cylinder which can be set to allow stem retention from 0–100%. There are variable speeds on the cylinder and beater bars. An option is a crusher with four polymer rollers to burst the berries after destemming.

As the diameter of the destemmer is relatively large, the destemming surface is very important: 2.3 m^3 for the Model ECR 30 and 1.3m^3 for the Model ECR 15. This allows slow rotation speeds and maximum quality destemming. The drum and destemming shaft rotate in the same direction, in order not to shear the stems. The edge of the drum holes are rounded in order not to cut off the stems.

The destemming shaft is eccentric with regard to the drum. In the tangential shaft/drum area, the drum is permanently declogged, which is particularly useful for cleaning of leaves that come with mechanically-harvested grapes and blind the holes.

Model ECR-15 has an average capacity of 15 tons/hr. The speed variation is 11 to 20 rpm on the destemming drum and 175 to 315 rpm on the destemming shaft.

Model ECR-30 has an average capacity of 30 tons/hr. The speed variation is 14 to 20 rpm on the destemming drum and 220 to 280 rpm on the destemming shaft. There are adjustable, swivelling ends on the destemming paddles. The distance of the destemming shaft to the drum is adjustable.

Model ECR-70 has an average capacity of 70 tons/hr. The drum has two cylindrical sections of different diameter (small diameter in the destemming section; large diameter in the stem discharge section).

Available as must pumps are the PM 200 or PM 500 elliptical rotor pumps.

Inquiries to: KLR Machines, Inc., 1925-B Francisco Blvd., San Rafael, CA 94901, (415) 456-4774; 47 W. Steuben St., Bath, NY 14810, (607) 776-4193.

SEE OUR AD PAGE 7

Process Engineers, Inc.

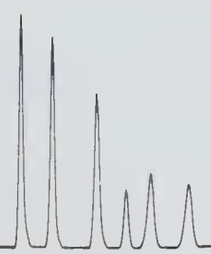
Two manufacturers are represented.

The *Demoisy* crusher/destemmer has all product contact parts of stainless steel including the pump. Easy removal of one light-weight cover exposes the entire inside of the stemmer for cleaning. The unit consists of two independent pieces, a crusher/stemmer and the must pump, both of which are mounted on wheels for easy movement. The must pump is a rotary piston (of elliptical design) with a spring-loaded follower plate, and the hopper is stainless steel. The destemmer screen can be partially removed in order to allow some or all of the stems to remain in the must.

The crusher and destemmer are powered by independent

ETS

1204 Church Street
St. Helena
California, 94574
(707) 963-4806



REGULATORY AND EXPORT ANALYSIS

Ethyl Carbamate (Urethane)	GC/MS	E.E.C. V.I.1 Export Analysis
Diethylene Glycol	GC + GC/MS	Japanese Export Analysis
Methanol	GC	State & Provincial Requirements
Histamine	HPLC	Nutritional Statements
Sodium Azide	HPLC	Caloric Content

Strict quality control and high sample capacity assure reliable results with prompt turnaround. Capabilities including liquid chromatography (HPLC), gas chromatography (GC) and gas chromatography/mass spectroscopy (GC/MS) meet the most complex analytical requirements.

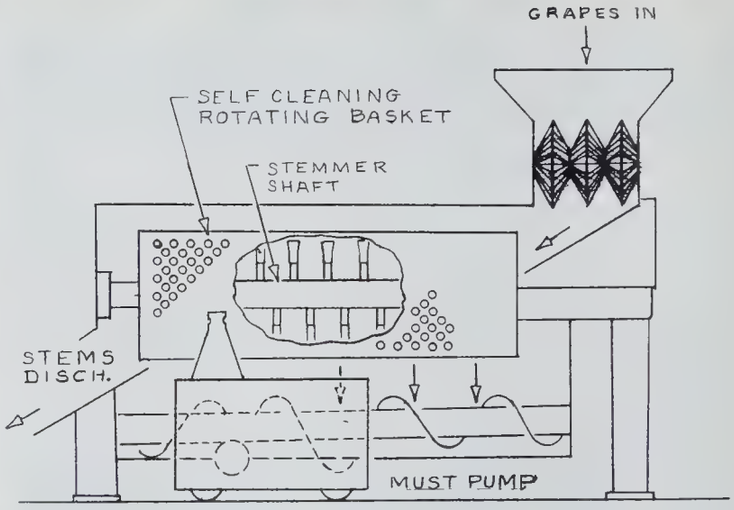
Demoisy crusher-destemmer at De Moor Winery, Oakville, CA.

variable speed drives to suit grape conditions. The cone-shaped crusher rolls are designed so that most of the crushing is done by the sides of the rolls. The roll clearance is adjustable so that when bunch rot is detected, the effected grapes will pass through the rolls uncrushed and come out with the stems. The rolls are spring-loaded so that if foreign objects are fed into the machine, the rolls can spring apart, minimizing chances of damage.

The models with capacities and equipment options are:
Model V-7S – 6 tons/hr with or w/o crusher.
Model D-4S – 10 tons/hr with or w/o must pump.
Model D-8S – 20 tons/hr with or w/o must pump.
Model D8-P280 – 20 tons/hr with P-280 must pump.
Model P-280(25) must pump – 20-35 tons/hr.
Model D-10S – 30 tons/hr with or w/o must pump.
Model D-10P-280 – 35 tons/hr with or w/o must pump.
*Model ET-20 – 20 tons/hr with basket cleaner and with or w/o must pump.
Model PP-280 must pump – 60 tons/hr for use with ET-60.
*Model ET-60 – 60 tons/hr with basket cleaner and with or w/o must pump.
**with or w/o crusher and with or w/o a moveable crusher on rails (USA modificaton).*

Now available from Process Engineers, Inc. is an American designed replacement of the gear case for a D-6 must pump with a direct-drive assembly. The modification eliminates the maintenance required on the bearings, seals, etc. It requires modifications to the frame and safety guards. The screw conveyor, in the hopper, is driven off the end of the pump shaft.

There is a *PERA* horizontal stemmer/crusher with a 90 tons/hr capacity. The 12.5hp machine has speed variations from 150 to 250 rpm. The rotary screen is stainless steel and the shaft is equipped with stainless steel arms and rubber paddles. It has a slow rotation speed that is gentle in destemming.



Cross-section of Demoisy Model ET-20 crusher-destemmer.

Inquiries to: Process Engineers, Inc., 3329 Baumberg Ave., Hayward, CA 94545, (415) 782-5122.

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Rossi Lugga destemmer.

Prospero's Equipment Corp.

Two manufacturers are represented.

The *Rossi* Lugga model can handle six tons/hr. The hopper can hold ½ ton of fruit and is constructed on an incline to allow easy feeding of grapes. The all-stainless-steel destemmer is powered by a 4hp motor with adjustable belts and is equipped with a forward and reverse switch. A centrifugal must pump is included.

The *C.M.E.* model DP 120 handles 12 tons/hr. This all stainless steel unit has a destemming cylinder which revolves at low speed to achieve complete destemming with minimal damage of stems. After destemming, the grapes drop through adjustable rubber rollers for complete crushing. The machine is equipped with a diverter plate to bypass destemming and feed grapes directly to the rollers. A four-inch must pump is removable and can be used to pump pomace from fermentors into a press. All internal lubrication points can be serviced by external fittings and flexible tubing.

Inquiries to: Prospero's Equipment Corp., 134 Marble Ave., Pleasantville, NY 10570, (914) 769-6252; 840 Piner Rd. #14, Santa Rosa, CA 95401, (707) 523-2900; 715 Arroyo Ave., San Fernando, CA 91340, (818) 365-4403; 2758 NE Broadway, Portland, OR 97232, (503) 287-2624; 725 Climer St., Muscatine, IO 52761, (319) 263-4410.

SEE OUR AD PAGE 2

Amos destemmer-crusher at Robert Mondavi Winery, Oakville, CA.

RLS Equipment Co., Inc.

In the *AMOS* destemmer/crusher, grapes are destemmed before being crushed by adjustable rubber rollers that can be opened up to 1¼ inches apart. The unit is constructed completely of stainless steel, including the destemming fingers, and the cage is made of polypropylene.

The separating cyclinder is made in segments that can be quickly taken apart, making the unit inexpensive and easy to repair in case of damage. The separating cylinder can be purchased with a standard-size opening of ¾ X ⅞ inches or can be ordered with larger or smaller openings as needed, depending on the type of grape to be processed. A moveable chute is available so that you can bypass the crushing section or you can go through the cage and only crush mechanically-harvested grapes.

The model A-15 has a capacity of 15 tons/hr. Model A-50 has a capacity of 50 tons/hr. In 1987, the model A-25 with a 25 tons/hr capacity will be available.

Also available is the AMOS AMP-15 must pump, which fits under the destemmer/crusher and is designed to run at very slow speeds. It has a screw conveyor feeding into a rotor-stator pump which allows connection of this pump to a central fill for a pressing system.

Inquiries to: RLS Equipment Co, Inc., 1017 White Horse Pike, PO Box 282, Egg Harbor City, NJ 08215, (609) 965-0074.

SEE OUR AD PAGE 17

Valley Foundry & Machine Division, AMETEK

The *Valley* all-stainless-steel destemmer design includes a unique combination of slow rotor shaft and rotating screen speeds to provide a gentle action to provide optimum rupturing or crushing of grape berries while de-stemming with minimal shredding or maceration of the stems or without seed damage.

The rotor assembly consists of long, curved blades designed to effectively discharge stems and crush the grape. The screen assembly has round, countersunk holes to minimize stem fracture or shredding. All designs have grape receiving sumps with screws in the bottom to feed the must pump outlet. All models may be equipped with specially designed berry crushing rolls.

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Valley destemmer-crusher at Arciero Winery, Paso Robles, CA.

Models and capacities are:
Model 5 – 3–5 tons/hr
Model 5B [field unit] – 3–5 tons/hr capacity, can be driven off a power take-off drive of a tractor, either through direct mechanical linkage or hydraulic motors.
Model 55 – 10–15 tons/hr
Model 135 – 25–30 tons/hr
Model 195 – 50–55 tons/hr
Model 220 [field unit] – 80–110 tons/hr

Valley also offers a garolla-type rotary crusher design consisting of a rotor assembly with primary crushing paddles, secondary crushing blades and stem fan or dryer blades suited for use with *labrusca* and most hybrid grapes.

The screen assembly consists of three separate screens: a small diameter primary crushing screen with round, countersunk holes; a removable, wrap-around slotted-type secondary crushing screen; and a large diameter round perforated drying screen. The built-in receiving sump has screws of the right/left design for feeding a must pump outlet in the center of the crusher.

The following units can be customized and furnished with all contact parts of stainless steel or a combination of stainless steel and bronze:
Model 40 – 20–25 tons/hr
Model 140 – 40–50 tons/hr
Model 180 – 60–70 tons/hr
Model 240 – 100–150 tons/hr

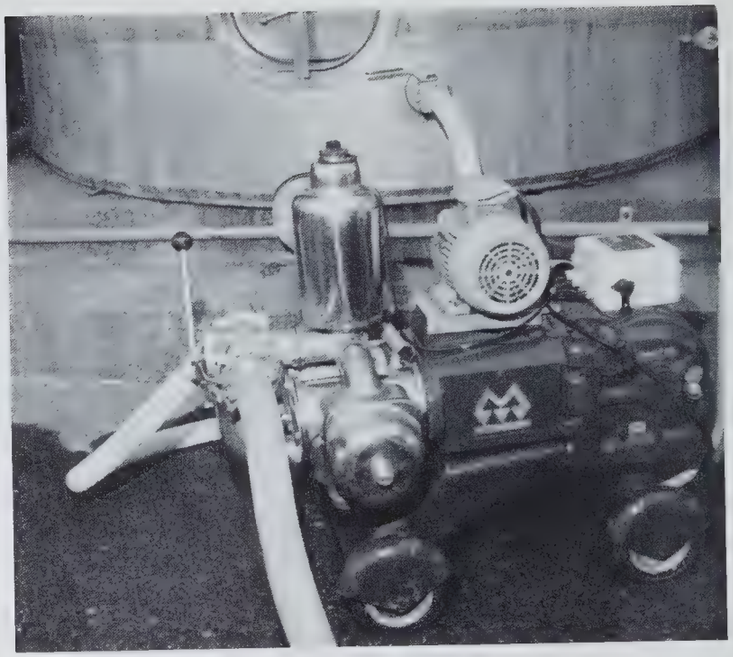
**Inquiries to*: AMETEK/Valley Foundry & Machine Div., PO Box 1626, Fresno, CA 93717 (209) 233-6135.

Scott Laboratories, Inc.

A complete line of *Manzini* must piston pumps with bronze pump body with stainless steel accessories or all stainless steel product contact parts are available to complement a destemmer/crusher. The pumps include two speeds, a flow/reverse device and an adjustable automatic pressure on/off switch.

Customers must supply voltage requirements when ordering and butt-weld their own US-threaded fittings for hose attachment. The stainless steel pump parts include: removable cylinder, piston, seal covers, valve seats, nuts and bolts, pressure chamber and other internal parts.

The single-piston [bronze pump body + stainless steel accessories] models and capacities are:
Model SM/50 for liquids – 1,300 gal/hr
Model SM/85 for liquids and must – 1,200 gal/hr [1st speed]; 2,250 gal/hr [2nd speed]
Model SM/120 for liquids and pressed grapes – 1,700 gal/hr [1st speed]; 3,200 gal/hr [2nd speed]



Manzini pump model #420 at Beringer Vineyards, St. Helena, CA.

For liquids, pressed grapes, and lees the single-piston models are:
Model SM/190 – 2,600 gal/hr [1st speed]; 5,000 gal/hr [2nd speed]
Model SM/240 – 3,400 gal/hr [1st speed]; 6,300 gal/hr [2nd speed]
Model SM/320 – 4,500 gal/hr [1st speed]; 8,400 gal/hr [2nd speed]

The double-piston [bronze pump body] models for liquids, pressed grapes, and lees are:
Model 2 C/330 – 4,500 gal/hr [1st speed]; 8,700 gal/hr [2nd speed]
Model 2 C/400 – 6,000 gal/hr [1st speed]; 10,500 gal/hr [2nd speed]
Model 2 C/500 – 7,400 gal/hr [1st speed]; 13,000 gal/hr [2nd speed]
Model 2 C/600 – 8,700 gal/hr [1st speed]; 15,800 gal/hr [2nd speed]
Model 2 C/800 – 11,300 gal/hr [1st speed]; 21,000 gal/hr [2nd speed]

The single-piston [stainless steel series] models for liquids are:
Model SM 120 INOX – 1,700 gal/hr [1st speed]; 3,200 gal/hr [2nd speed]
Model SM 200 INOX – 2,600 gal/hr [1st speed]; 5,200 gal/hr [2nd speed]

For liquids, must, and lees, the single-piston [stainless steel series] models are:
Model 2C 350 INOX – 4,700 gal/hr [1st speed]; 8,800 gal/hr [2nd speed]
Model 2C 420 INOX – 6,000 gal/hr [1st speed]; 11,000 gal/hr [2nd speed]
Model 2C 700 INOX – 10,000 gal/hr [1st speed]; 18,500 gal/hr [2nd speed]

Inquiries to: Scott Laboratories, Inc., PO Box 9167, San Rafael, CA 94912, (415) 457-8460.

SEE OUR AD PAGE 3

DRIP IRRIGATION GUIDELINES FOR VINEYARDS

Steve Soper

Drip systems are well-suited for vineyards. A drip system delivers the water right to the root zone area where it is available to the vine. Because of this method, fewer weeds are germinated and less tractor cultivation is necessary for weed control. Much less fertilizer is used when applied through the drip system, which can be a significant cost savings. Drip systems do require a certain amount of management, which is why they must be designed and operated properly.

Vineyards require a certain amount of moisture to maintain a crop until harvest. But most winter rain water stored in the soil drains out in mid-spring and early summer. This is where the challenge begins. How much water is necessary? How many irrigation blocks should there be, and how big should they be? What size pumps are necessary?

Analysis of Water Sources

The first step is to evaluate available water sources. Wells are the most common source of water. If adequate water cannot be supplied by wells, then a reservoir may have to be constructed to store irrigation water. Reservoirs can be filled by water runoff from rain by springs, creeks, drainage sumps, or low-capacity wells. In sizing reservoirs, it is important to determine the total amount of seasonal irrigation water required for a six-year-old mature vineyard. Season evaporation from the water surface should also be considered in the calculations. This will help determine how many acre-feet of water storage are needed.

Winery waste water is also a source of irrigation water. Water quality has to be improved by aeration and/or chemical treatment.

Generally speaking, the irrigation requirement for a six-year-old vine can be 100–200 gallons of water/year. It is usually applied over a four- to five-month irrigation period. These amounts may vary due to grape variety, soil type, topography (high ground versus low, flat ground), vineyard location, and microclimate. The irrigation requirement may vary from grower to grower depending upon individual farming practices, and also from winery to winery depending upon individual wine styles.

Drip System Design

Planning of the drip irrigation system should include knowledge of location of wet soil spots and rocky ground. A grower knows where he wants to plant certain grape varieties due to soil differences, sun exposures, etc. Irrigation blocks can be determined by addressing these problems and questions before the system is designed and installed. This gives the grower all the flexibility he needs to deliver the required amounts of water to different growing conditions and soil types. In many cases, irrigation block size is determined by water availability from the water source.

Typical tensiometer 'station' as used in winegrapes. Utilizes 18-inch length to monitor soil moisture in 'shallow' root system and 36-inch length for 'deeper' root system.

Consideration should be given to location of block valves for ease of operation, as well as placement of mainlines and submains in case the vineyard is ever replanted. If the distribution lines are installed outside of the vineyard planting area, soil ripping and fumigation can take place throughout the planting area.

Choice of Pumps

After the irrigation blocks have been determined, the irrigation pumps can be chosen. If there is a well, a turbine or a submersible pump is needed. Hopefully, there is electricity available which can be brought to the site by the utility company within the project timetable. To determine the pump requirements, consideration should be given to the depth of the well, friction losses in the piping system itself, highest water lift required in the system, and a wear factor in the pump itself.

If a reservoir is the water supply source, then either a centrifugal pump or a submersible pump may be used. Submersible pumps are sometimes necessary because they have a greater water lift capability than centrifugal pumps. Safety shut-offs should be installed on the pumps to protect them in case they run out of water or lose their prime. If an engine is used as a power source, it, too, should have safety shut-downs.

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Determining Water Quality

Water quality is very important, especially when dealing with a drip system. If wells are the water source for the drip system, a complete water analysis should be done. Any undesirable minerals in the water should be identified before a drip system is decided upon. Iron and calcium are two minerals that can be a problem for a drip system if not dealt with properly. Some water-soluble fertilizers may not be compatible with minerals present in well water. If reservoirs are used to store irrigation water, then a water quality program should be developed.

Reservoir water should be properly treated to keep the algae population down during the warm summer months. Copper sulfate, at 1–2 lbs/acre-foot of water, and other products can safely be applied to reservoirs to maintain high water quality. Many of these products are compatible with fish life as well, which is often a concern to reservoir owners as well as water quality.

Filtration

Filtration of water is the most important part of a drip system. A proper filtration system installed on a drip system will prevent problems with clogged emitters. Screen filters and/or sand separators may be sufficient protection for the drip system if wells are used. If reservoirs are used, sand media filters are best to trap algae and other organic material on top of their sand bed. These filters should always be automated or self-cleaning.

When a 10-psi pressure differential occurs between the intake water and the filtered discharge water, the automatic controller will backflush each filter in sequence. The controller can also backflush the filters on an hourly schedule throughout the irrigation cycle. The automated backflush equipment on the filter system will insure full delivery of the desired amount of water to the vines during the irrigation cycle. A water meter should be installed in the mainline downstream of the filter station. This allows monitoring of water delivered to each individual block.

If the normal amount of water has not been delivered during the irrigation application, it may indicate a problem in the system. The filters may not be allowing enough water through to the system, or there may be a break in the piping system. Drip emitters may be partially clogged with algae or mineral deposits, which does not allow the proper amount of water to be applied during an irrigation cycle. A check valve should also be installed downstream of the pump station to keep static water pressure off the equipment when it is not in use.

Emitter Flow

Emitter flow variation in any irrigation block should not exceed +/- 10%. In order to have uniform growth and to be able to apply chemicals and fertilizers through a drip system, this is critical. The irrigation system designer has to make sure he designs his system so that the chosen emitter does not exceed +/- 10% of desired flow rate. Pressure-compensating emitters may be used to insure proper flow rates due to elevation changes in the vineyard or long planting rows. Pressure regulators can be used as well in the irrigation system to keep emitters within their desired flow range. Proper placement of air vents, flush valves, and pressure relief valves are essential in a drip system.

Water penetration into the soil is sometimes a problem with drip systems. Generally, two ½-gallon/hour emitters per grapevine are used. They are placed on either side of the vine to apply water on both sides. In hillside vineyards, if runoff oc-

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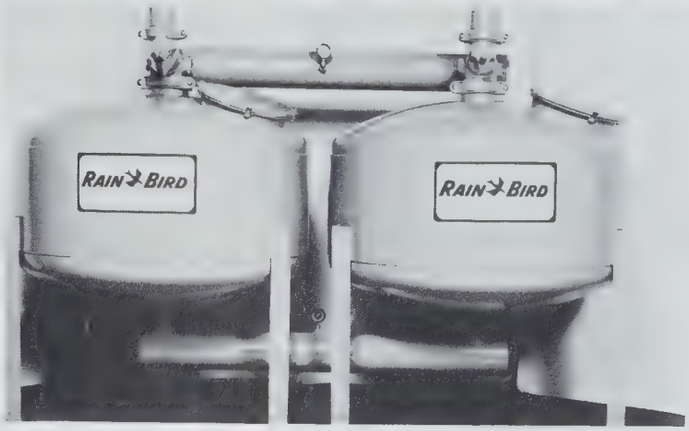

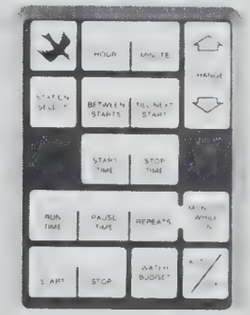

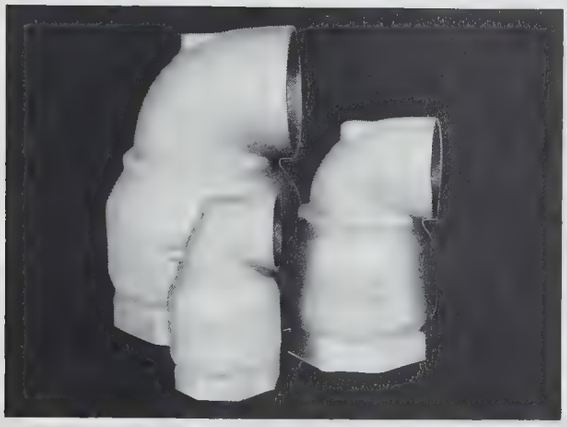

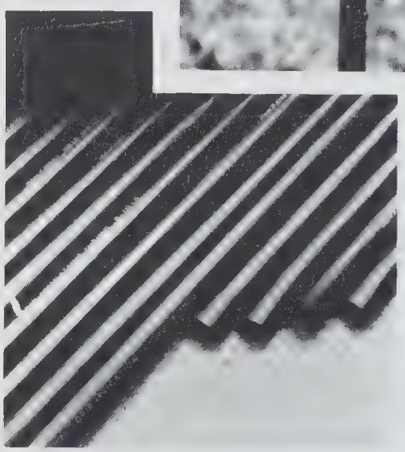

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Bob Uttermohlen uses neutron probe to determine soil moisture.

curs, small basins may be made under each emitter. This helps hold the water and gives it more time for soil penetration. Another important factor in using two emitters per vine is to develop the root system on both sides of the plant. Roots travel well in wet soil. A much larger root system can be developed, using two emitters per vine, making more soil amenities available to the vine.

Irrigation Scheduling

Tensiometers, gypsum blocks and neutron probes are three methods of moisture monitoring to schedule irrigations. The tensiometer is the least expensive and easiest to use of the three methods. Irrigation scheduling is extremely important in a vineyard with different soil types, different grape varieties, and different sun exposures.

Tensiometers are commonly used to monitor the amount of moisture in the soil available to the vine. The tensiometer reads from 0 to 100 centibars, or about 1 bar suction. A tensiometer station usually consists of two instruments. Both are installed between the grapevine and the emitter, one at 18" depth, the other at 36" depth. They should not be installed directly under the emitter. Generally speaking, 75% of the water used by a grapevine is from the feeder root zone, located 18" - 24" below ground surface.

This is why it is important to monitor the available soil moisture to the vine and not let the vine become stressed. Tensiometers should be located in different soil types as well as high ground areas and low, flat areas. Varying soils all have different moisture-holding capacities and different irrigation demands. An irrigation cycle is started at a gauge reading of 40 centibars, and continues until the reading is lowered to 10 centibars, when the irrigation cycle can be stopped.

This allows gases given off by the roots to be released into the soil. If the irrigation cycle was continued until a tensiometer reading of 0, the feeder root zone would be totally saturated. In this condition, the gases given off by the roots cannot be released, and growth stops. Thus, by irrigating within the 40- to 10-centibar range, the vines are never stressed and are always growing.

Fertilizer Additions

When soil and petiole analyses have been done, a fertilizer program can be established. Tensiometers are important in applying fertilizer through a drip system. By monitoring the reading on the 18" tensiometer, fertilizer can be applied to an irrigation block during the first hour of irrigation. The water and fertilizer move down to the 18" level by continuing to irrigate until a reading of 10 centibars is reached on the 18" gauge. The drip system is then shut off and the fertilizer is available to the feeder roots at the 18" level.

If the fertilizer is applied and a long irrigation occurs, the fertilizer can be flushed below the entire root zone of the vine, which would receive no benefit from the fertilizer application at all. This is why it is important to know how water moves in different soil types.

Fertilizers are commonly injected into drip systems by use of an injection pump, a venturi unit or a pressurized mixing tank. A drip irrigation pump station can be designed to use any one of these methods. The fertilizer used should be water-soluble. A test should be made using the water source before the fertilizer is applied through the drip system. The fertilizer solution should be injected upstream of the filter station so that any insoluble particles are trapped in the filter screen or sand media filters and not released downstream to plug emitters.

Installation

Installation of the drip system should be done during the spring or summer months. Mainlines and submains should be installed in avenues so they can be easily repaired if a break in the pipe occurs without causing damage to surrounding vines. Vineyard cultural practices throughout the summer months will help compact the soil over the mainline and submain pipes after they have been installed. If installation occurs in the fall without proper soil compaction, winter rains can wash away soil and uncover the pipes in hillside vineyards.

Maintenance

A good maintenance program is an essential part of any drip system. Water quality in a drip system should always be monitored so that if a problem occurs, it can be dealt with before any emitters become plugged. Pressure gauges on the intake and discharge of all screen and sand media filters will indicate any blockage and pressure losses. This pressure loss tells the operator that those filters are dirty and must be cleaned.

Periodic flushing of submains and polyethylene lateral lines will also show any buildup of algae or minerals in the pipe distribution system. They should be flushed once a month or as necessary. Emitter flow rates should be checked periodically to make sure the emitters are not partially clogged with algae or mineral deposits.

At the end of the irrigation season, the drip system should be drained to keep any algae from growing during the months of non-use. An injection of chlorine may be necessary if all the water cannot be drained from the system. This will kill any algae that may be in the water distribution system. Sand filters should be treated with chlorine and drained as well. If these procedures are followed, the irrigation system will be ready for use when the next irrigation season comes around.

Summary

Drip irrigation systems are an essential part of grapegrowing in most areas. They can make a big difference in the production and quality of fruit produced. A drip system should be treated like any other piece of equipment. It must be operated properly and have a scheduled maintenance program. When these procedures are incorporated into the farming operation, the drip system becomes an important asset.

Can You See A Taste?

Sondra Barrett, Ph.D

When I began photographing wine through a microscope four or five years ago, I was only looking for beautiful representatives of the 'inner' world of living things. However, my scientist's eye started seeing patterns and forms that repeated themselves with regularity in specific kinds of wines. I amusingly speculated that those luscious microscopic forms that I found in wine were the chemical triggers for taste and the biological basis for the language of taste.

My first meeting with winemaker Theo Rosenbrand encouraged me to continue looking at wines in this simple, unconventional way. When he responded to a photomicrograph of the 1978 Sterling Vineyards Merlot with, "That's what it tasted like!", an "Ah-ha!" flashed through my mind—perhaps photomicroscopy could see the taste of a wine. After all, I did see shapes that were sharp in demeanor and others that were rounded, supple, and smooth—weren't those terms also used to describe wines? We are all used to hearing one art form—winemaking—explained by another—poetry. Why not use yet another art form—photography—to help with the characterization of wine?

Ten years of research on the microscopic and chemical changes during maturation and growth of human blood cells had given me visual training and expertise to see microscopic patterns in wine. It seemed unlikely that these microscopic images could have anything to do with the ageing and maturation of wine.

Yet as I accumulated more microscopic wine signatures, the visual evidence began to convince me that these strange yet beautiful forms in wine needed further investigation for their potentially useful application. Following is a glimpse of the visual information I have uncovered, which may provide us with another way to appreciate and, perhaps, understand wine.

I applied differential interference microscopy to develop the basis of a new analytical method for assessing ageing, blending, and varietal quality in grapes and wine. Over the past five years, a dictionary of forms or 'wine alphabet' has evolved which helps me look into the essence of wine. Each form in this alphabet is given a number, since microscopic structure, like taste, evades accurate verbal descriptions. The constellation of shapes in a particular wine is its wine signature, which can be portrayed photographically or quantitatively.

Wine signatures change with age, different winemaking practices, and blending. Figure 1 compares the quantitative representation of the wine signatures of two different Cabernet Sauvignons (Inglenook Limited Cask), showing the percentage of each of the forms present.

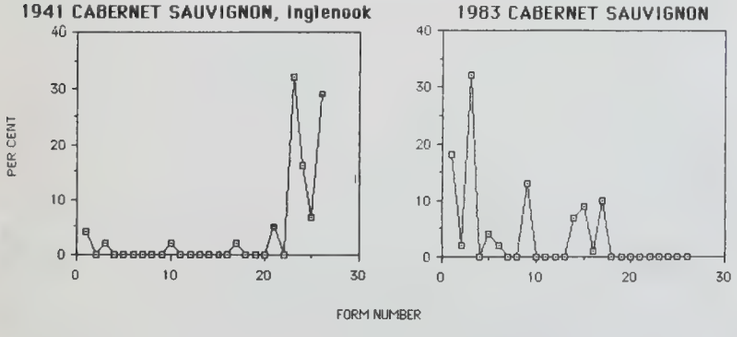

Figure 1. *Graphic display of microscopic wine signatures of a young and an old Cabernet Sauvignon. Forms 23–26 are 'Cabernet-specific' forms; Form 10 is often found in old wines.*

The hypothesis set up by this work is that this visual microscopic language could help us learn more about the structure of wine while objectifying our descriptions of the taste of wine. Most of us can taste the difference between a young and an old red wine. We can now also *see* visual differences besides color associated with ageing.

In the evolution of these new wine descriptors, several forms became indentifiable with qualities of age: three were found predominantly in fermenting wines or wines younger than three years old; one, in wines older than 10 years. The forms in young wines are normally lost during ageing. Different ageing practices such as type and time of cooperage influence the quantity and nature of these forms. Young, angular wines give a wine signature of 'immature' sharp forms. Tartrate salts are the most likely candidates for the chemical identity of these early forms. The presence and possible evolution to other forms could provide inexpensively-obtained objective information for evaluating ageing practices.

The form frequently observed in old wines may be a visual indicator of decline. In only two instances out of hundreds of observations has this form been found in wines younger than 10

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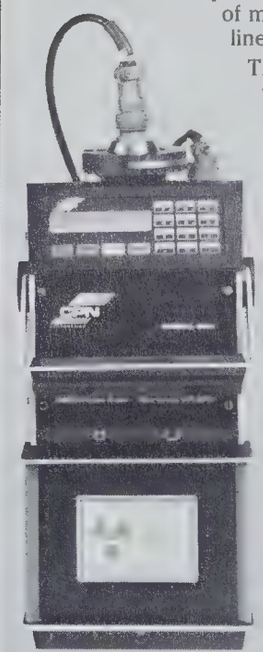

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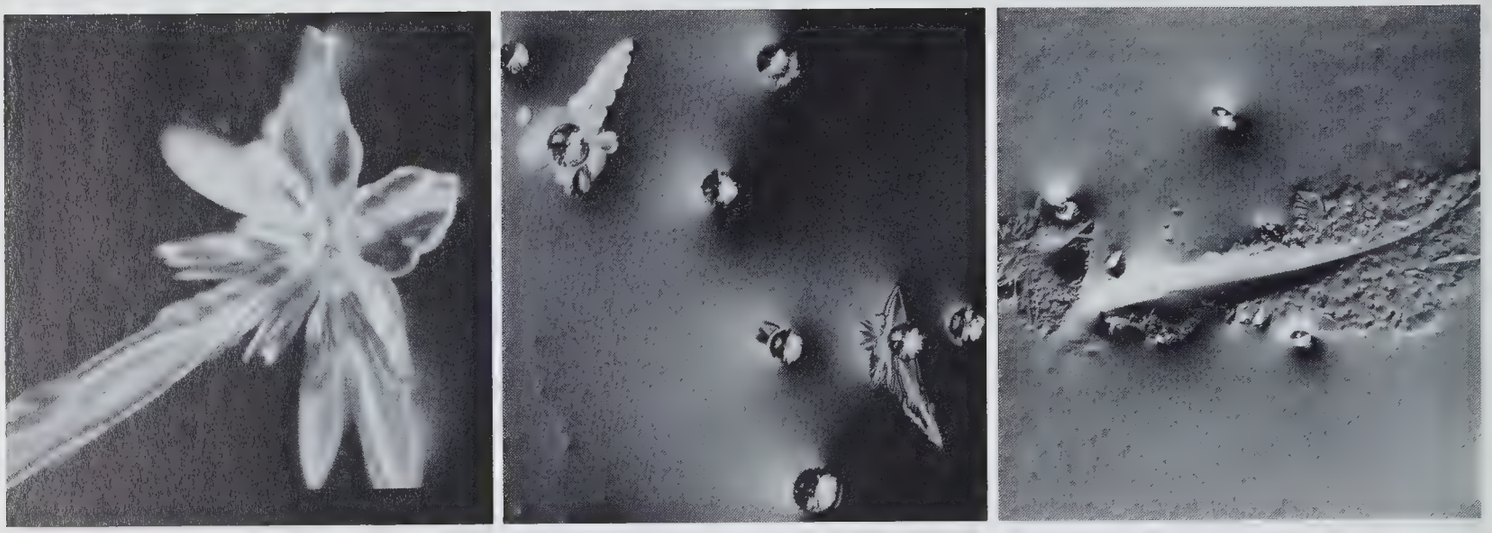

Forms identified through photomicroscopy: (l) Chardonnay-specific form; (c) 'buttons' in 1968 Inglenook Cabernet Sauvignon; (r) 1959 Cabernet Sauvignon—this form is often found in older wines.

years. One was minimally contaminated with bacteria and the other just starting to 'go', according to taste. This visual clue could give us evidence, earlier than detectable organoleptic changes, that a wine is heading 'over the hill'.

Maturation of wines may be measurable microscopically. So, too, can varietal character be investigated. About half of all Chardonnays observed have a distinctive yet related wine signature. Cabernet Sauvignons with distinctive varietal character may also show pronounced visual traits. Observations of several hundred California Cabernets revealed four forms which developed over time in some of the wines. These particular forms appear to be useful in following the development and longevity of Cabernet. Looking at, and not tasting or smelling, 15 unidentified 1984 red wines from UC Davis showed that the two Cabernets were the only ones with Cabernet-specific forms.

Since I wanted to see if people could 'see while tasting' these forms, I decided to put this system to the test. Previously, at numerous tasting events with professionals and inexperienced tasters, I had found that some individuals can learn this visual language and even enjoyed 'getting into' wine in new ways.

At the Society of Wine Educators 1986 Annual Conference, I presented a workshop on photomicroscopy and ageing of Cabernet Sauvignon. The format was the initial presentation of the 'wine alphabet' with associated qualities of taste or age. Participants then had the opportunity to try their new talents in visual perception of five unidentified Inglenook Cask Cabernets, 1974–1983. This group could taste and see the difference between young and old wines.

Seventy-four percent could identify organoleptically the youngest wine. When asked which wine tasted the 'sharpest' and would most likely have microscopic sharp forms, about half predicted the 1983 Cabernet, the wine which contained the most sharp forms. Eighty percent of the group could, by taste, identify the oldest Cabernet and, again, more than half the group predicted that this wine would have an old-age form of 'decline', which it did. Furthermore, another visual characteristic which seems to distinguish exceptional Cabernets, was tasted 'visually' by the group. This particular characteristic was perceived by taste to have a varietal-specific forms not present in less distinctive wines.

The theoretical relationship between taste, quality, and microscopic form—form and function—is open to question. Yet as I talk to members of the wine community, I discover that there are supporters of this idea, people who see the potential of using wine signatures in practical ways such as making blending decisions. I suggest that we start to use these wine signatures as descriptors of taste adjunct to organoleptic terms.

The next time you taste a wine, close your eyes, and perhaps images will come to your mind—images of the taste. Can your taste *see*?

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Burgundian Viticulture: Methods, Part III

Don Blackburn

Training and Canopy Management

In Côte d'Or, the vine trunk rises about 16 inches to the first wire. The single cane is tied to that wire, and the foliage is trained up toward the top wire, 35–40 inches above the ground. The cane tip will be trimmed off before it bends over. This upward orientation is a key element in the French method. It makes for a narrow foliage.

There is usually a third wire between the top and the bottom wires. In addition, most vineyards have two moveable wires which hold the vegetation in place. These are positioned on opposite sides of the foliage. They are attached to each other with loose hooks, so that the vegetation is pinned between them. After harvest, the hooks are removed to allow the wires to be dropped to the ground, out of the way during pruning. At this point, they are still attached only at the two ends of the short Burgundian rows.

As the spring shoots grow and splay out into the row, the moveable wires are lifted up and set into their supportive juxtaposition, using the same hooks that had been removed the previous autumn. The wires will be moved higher later in the spring to follow cane growth. Once or twice each season, workers go down each row to stow any errant shoots inside the moveable wires.

Upward training of shoots in Burgundy, and in France in general, has the great attribute of putting the grape in an environment well-aerated for fungal inhibition, and warmed for enhanced metabolic activity. Clusters seldom have more than one leaf shading them, and are thus spared from the cloistered confinement which has been shown to cause pH and flavor problems in draped canopy vineyards in other parts of the world.

Underlying this method is the importance of the vigor of the individual vine. Its moderation is maintained in part by spacing, but also by habitat (soil, climate, exposition) and vine genetics. Harmony or discord in these interrelationships is quite apparent to the grower because of all the factors that give him little leeway. Foliage can't extend more than a meter along the row without butting up against the next vine (the law requires one meter by one meter spacing). It can't spread more than 8–10 inches laterally without getting caught on the tractor. Nor can it raise much above the post height for the same reason.

Straddling tractors—*tracteurs enjambeurs*—are used in Côte d'Or, Beaujolais, Maconnais, Champagne, certain areas in Bordeaux such as the Médoc, throughout the Loire Valley and many other regions. Wherever the spacing is at or near 4,000 vines/acre, they are pretty much the only way to go. In some regions, such as Alsace and St. Emilion, where rows are about 1.4 meters apart, growers use garden-size standard agricultural tractors which pass between the rows. At the other extreme, some growers in Chateauneuf du Pape use *enjambeurs* as large as our mechanical harvesters, and with enough clearance to drive over a Cadillac.

The *enjambeurs* used in Burgundy are smaller than this, but still tall and top-heavy. They pass within 8–10 inches of the vine trunk on either side. On some models, the foliage passes so close between the driver's legs that he can pick off leaves easily by hand. Due to these many points of potential contact, one has to have a good eye, especially when entering a row. Given the tractor's high profile and the need to handle substantial slopes, it is a little like driving a motorized painter's scaffolding down a desert freeway in a stiff cross wind.

Spring and Summer Operations

Thinning of buds and the later thinning of shoots is an important accompaniment to necessary crown suckering. Double shoots and spindly shoots must be removed to give foliage essential aeration and illumination. None of the Burgundian varieties, as grown in Côte d'Or, throw abundant suckers, but the difficulty in achieving ripeness makes these operations an important factor nevertheless.

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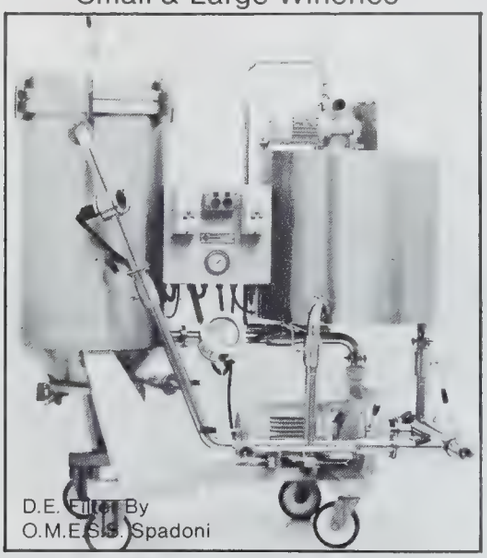

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Cluster thinning has appeared periodically in the development of French viticulture. Vignerons have generally viewed it with skepticism. When questioned on the subject, they respond that it would be rash to eliminate a portion of the crop in the face of hail, downy mildew, bunch rot and other locally virulent enemies of the vine. This attitude has some merit, but unfortunately it is associated nowadays with an indulgence concerning overcropping. The recent trend toward lighter, more simple, more 'varietal' wines is largely attributable to the high yields made possible by fertilization, pest control, and selection of vigorous strains.

In fact, the subject of cluster thinning almost never arises. The practice is all but unknown. It is noteworthy that the majority of winegrowers feel acutely the temptation to push their yields beyond the bounds they know to be set by wine quality. The exceptions, vignerons truly committed to quality, constitute a very significant minority.

One final note about cluster thinning relates the French perspective to results obtained in California experimentation. American data indicate that cluster thinning is of dubious value in usual California circumstances. These tests were carried out on vines with typical California vigor and proportionate crop levels. Crop reduction did not improve wine quality to a degree justifying the decreased quantity. These results reflect the predominance of vine vigor over crop level.

This did not, however, invalidate the practice of cluster thinning. Rather, it indicated that cluster thinning is not beneficial when it reduces the crop below a level appropriate in relation to the vine's vigor. In other words, it is not constructive to target a 'moderate' yield if vigor and fertility are oriented toward a 'high' yield.

Cane trimming is absolutely essential to the traditional spacing of Côte d'Or. The straddling tractor must pass over the vine to get through the vineyard. Unfortunately, the amputation of photosynthetic and transport tissue compromises the jobs that the foliage is there to do. It is also true that some benefit can result from trimming. 'Tipping' of spring shoots stiffens them, making them easier to tie up.

Furthermore, the appearance of laterals, after severing of terminal meristems (growth tips), does offer additional photosynthetic tissue. Growers in Champagne remove laterals in the hope of improving maturity. Yet Swiss research has shown that, after a late July trimming above the twelfth leaf, the laterals which then develop assure a significant increase in sugar production as compared to vines on which laterals were removed at the same stage. An unfortunate result of lateral growth can be leaf bunching, which can favor *Botrytis cinerea* and other fungi. French agronomers increasingly view trimming as a regrettable but unavoidable necessity.

The first trimming of the year focuses on cane tips. When done by hand, it becomes fatiguing. Workers must resist the tendency to lower their arms, because this would cause them to cut off more than the minimum needed to permit the passage of the tractor. For some time now, straddling tractors have been equipped with trimming attachments. If well-maintained and set at proper cutting height, they do a good job. The second trimming is really a 'hedging' in that the ends of the laterals are cut to preclude their getting caught on the tractor from the side.

When spring trimming is carried out too close to bloom, it can provoke shatter by causing a redistribution of resources away from the severed tips. The sudden surge toward the

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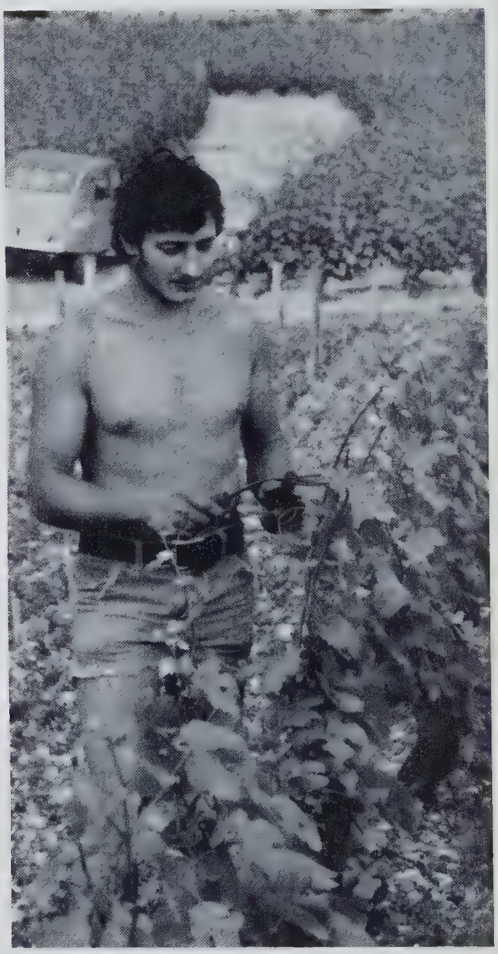
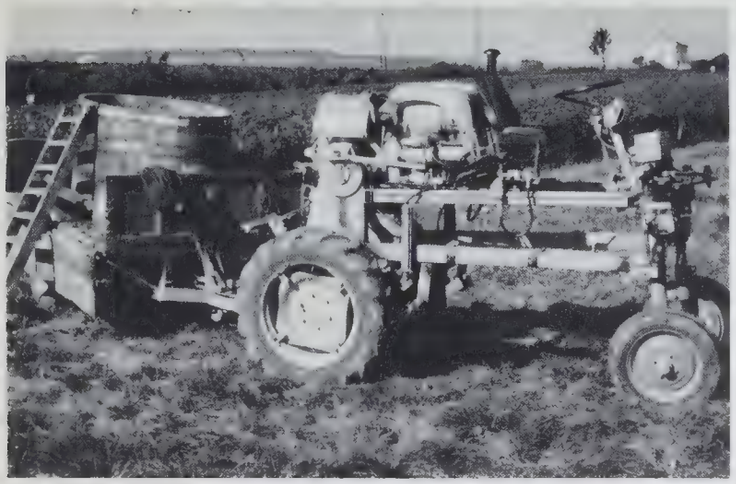


Hand-trimming. This operation permits the tractor to pass over the vine.



Straddling tractor drawing a wooden 'balange' on a trailer; it functions as a gondola.

flower clusters is alleged to cause their abortion. The same danger is attributed to trimming during bloom. On the other hand, a trimming carried out just after floral fertilization is felt to help 'set', because the embryonic grapes are then ready to receive and benefit from additional resources.

Unfortunately, cane growth is often too rapid to allow the initial trimming to be delayed until this point. Also, bloom is generally too early for the second trimming, which is a full hedging. Two general conclusions emerge from the existing information. First, hedging should be as late as possible in the season. Second, it should remove as little foliage as required to permit tractor passage.

Pathology

Growers in Burgundy are not surprised to have to spray ten times in a season. They sprayed fourteen times in 1977's rainy spring and summer. Young shoots are susceptible to sap-sucking mites, which are especially a problem when cool spring weather slows foliar growth.

Powdery mildew is a danger until veraison, but is not common in well-maintained vineyards. This is largely due to the effectiveness of spray penetration into the thin foliar plane. Downy mildew requires more moisture than powdery, but the summer rains more than suffice. Until the advent of so-called 'systemic' sprays, downy mildew was a constant worry because after a rain the vineyard was often too wet for the tractor to get through.

Downy and powdery mildew were part of the phenomenon referred to as the 'phylloxera crisis', a series of imported diseases which kept French viticulture reeling for 70 years (1850-1920). This plague also included a number of animal pests—caterpillars and mites—as well as the famous aphid, phylloxera. Since 1850, half of France's six million acres went fallow and were never replanted.

Spring frost has been rare in Côte d'Or, but hail periodically decimates localized areas. It has struck recently in 1979 and 1983. It is difficult to describe the devastating visual impression made by concentrated hail damage. Vignerons at home in the early morning hear a loud hammering on the roof. As soon as it is light, they hop in their cars, some of which may have broken windshields, to go out to survey the damage. They often end up walking over to talk to a neighbor in an adjacent plot. They will ask each other whether either has tried repruning after severe hail damage.

Hail follows topography, and strikes in well-known corridors. In bad cases, vineyards in the direct line of passage will have their foliage chopped to pieces or even completely stripped. Whole bunches, sometimes the entire crop, can be found on the ground. In the worst cases, nothing remains except the trunk and the cane from the previous year.

Some years ago, several of the local growers' associations contracted an airplane capable of seeding hail-laden clouds. Two pilots were hired and placed 'on call' in two shifts. The program lost credibility when hail fell on Burgundy while both pilots were lounging at the pool, unreachable by phone. What killed the program, however, was the fact that it was supported by voluntary contributions 'suggested' by the interprofessional organizations. Growers who paid disliked the fact that their colleagues who refused to pay got the same protection.

On the whole, Burgundians are quite community-spirited. In the more harmonious towns, growers have come to the aid of a neighbor too sick to prune his vineyards. They take turns donating a day's work until he has regained his health. The demise of the hail association demonstrates how goodwill can be stifled by unfortunate realities.

The two main viruses in Côte d'Or are fanleaf and leafroll. Fanleaf is especially a problem in the finest vineyards of Puligny Montrachet. It progressively diminishes vigor and yield. Leafroll has both of these effects, and also has a direct detriment on quality in that it slows the ripening process. Burgundian vineyards stricken with fanleaf often maintain good quality even as the yields taper off to insignificance.

At least one minor virus, 'stem pitting', appears to play a quite moderate role, decreasing vigor somewhat, but not drastically. Some feel that virologists might be doing a disservice in eliminating stem pitting. It is possible, though unproven, that this virus is a beneficial contributor to the excellence of Bur-

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gundy's existing vineyards. Only in recognizing this possibility could we invest the effort necessary to find out.

In the realm of viticultural pathology, the major scourge today is *Botrytis cinerea*. Each new synthetic fungicide temporarily gets the upper hand, only to be rendered ineffective by the development of resistant strains. Currently, Burgundian growers have no adequate spray. This situation underscores the importance of practices leading to weed control, soil permeability and proper foliar aeration. Looking at the problem more broadly, it is noteworthy that data from the School of Viticulture in Beaune shows a statistical link of 60% between bunch rot and high vine vigor.

Clonal Selection

Until recently, when a vigneron wanted to replant a vineyard, he would identify in an existing vineyard a number of vines which visually fit the criteria he sought. He would mark them, and then later, at pruning, save the wood drawn from them. This material would be grafted, rooted, and planted. This process is referred to as 'mass selection'. It is distinct from clonal selection in that it limits itself to a simple, momentary, visual appraisal, falling short of a reliable identification of viral presence.

Clonal selection studies a vine over several years in a test plot under controlled conditions. During this time, a substantial body of information concerning that vine's behavior becomes available. Clonal selection attempts to respond to the needs of French viticulture in a broader sense than just viral elimination. The process examines wood production, grape yield, juice composition and wine quality.

Now that many growers are planting certified clones, the situation is quite unlike what it was fifteen years ago. Then, each vigneron chose vines from vineyards he knew well. What he knew little about was the actual health of the mother vines he picked out and the diversity of their genetic makeups. Now, many or most growers choose certified clones from a list. Sometimes, they can taste examples of wines made from the various clones.

The typical vineyard planted nowadays is composed of fewer than five clones. Some vignerons feel that the diminution of the gene pool toward a monoculture leads to lesser wines. They also complain that certified clones have excessive yields. In fact, agronomers directing the clonal selection program have excluded the most prolific producers. However, the majority of certified clones do have substantial yields. Growers who have a heavy hand with the sacks of fertilizer easily get into trouble when these highly vigorous selections have been in the ground a few years.

Clonal selection in Pinot noir has lagged behind that of Chardonnay largely because Pinot noir has a far less uniform genetic makeup. Test plots in Côte d'Or include hundreds of Pinot noir clones. Ten of these are currently under study in Oregon. It should be stressed that these selections include the highest-rated clones as well as some others. These choices were made because it is not certain that the best clones for Burgundy will also be the best in another setting.

One thought that occurs to growers in France concerns the number of clones that should constitute a vineyard. Some feel it wisest to choose *the* clone which best fulfills the identified needs. Others suspect that such a practice yields a vineyard more susceptible to disease because of its lack of genetic diversity. Those holding this second point of view tend to select a number of the best performers, even if the second, third and fourth choices appear slightly inferior to the first.

Linked to this approach is also the suspicion that monoclonal vineyards yield more simple wine. Viticulture would benefit were this premise to be closely examined using modern methods.

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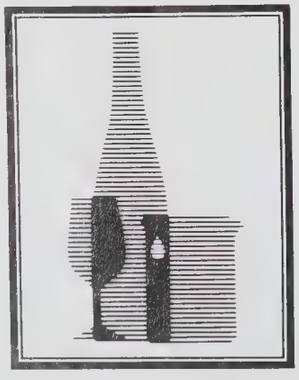

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Call Jim Hench for more information or a demonstration at your winery.

Levy Systems
A DIVISION OF S. LEVY, INC.
3425 SOUTH BASCOM AVENUE, CAMPBELL, CA 95008
(408) 371-4466

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When it comes to keeping cool there are many options and the correct choice could save you up to 40% in operating costs each year.

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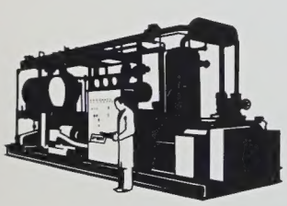

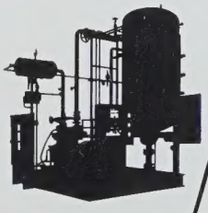

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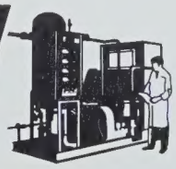
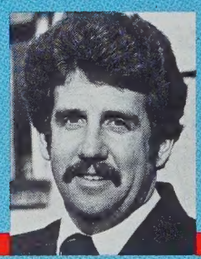


"Flow Rates Twice as High... Product Loss Cut in Half ...Better Quality"



Tom Eddy
Director of Winemaking
The Christian Brothers
St. Helena, California

That's what happened when Christian Bros. installed a Westfalia CA 365 Decanter and a Westfalia SA 100 Clarifier. As a result, this famous winery was able to eliminate filtering of juice to stop fermentation.

Prior to installing Westfalia equipment, says Mr. Eddy, "Our flow rates were approximately half... Juice losses in solids were about twice as high and final clarity needed to be significantly improved."

Now: "Our product losses have been cut by one-half to two-thirds. Previously about 10% of the feed was lost; now only 3–5%."

Christian Bros. takes a Westfalia team approach. The Decanter clarifies fresh juice. The Clarifier handles peak load overflow and also extracts solids and yeasts in actively fermenting juice—for precise control of fermentation. All these results are achieved without filters or diatomaceous earth.

The bonus: Far greater capacity, greatly enhanced by the efficiency of continuous, uninterrupted processing.

You can join Christian Bros. and the 250 other wineries that are enjoying the benefits of Westfalia "Wine Design" Centrifuges. No matter how big or small your operation is, you can satisfy your capacity requirements by choosing from eight Self-Cleaning Clarifier and seven Decanter models.

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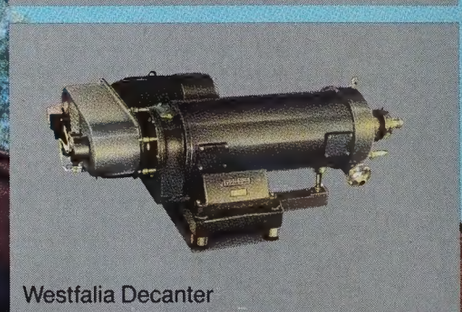
(415) 349-8900

Westfalia Clarifier



Westfalia Decanter